What matters more—the 'literariness' of a story, or what a reader thinks it is? Exploring the Influence of Genre Expectations on Transportation and Empathy

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Because mental functioning is essential to being human, the wide array of kinds and types of mental functioning displayed in narrative fiction enriches our store of conceivable models of human experientiality, suggests various views about its underlying features and regularities, and enlarges, through example rather than theory, our sense of what it may mean to be human.

—Uri Margolin, *Narrative Theory and Cognitive Sciences* (285)

The link between how narratives are structured and the phenomenology of conscious awareness points to an indissoluble nexus between narrative and mind…Furthermore, this same link between storytelling and consciousness goes to the heart of the problem of other minds.

—David Herman, *Basic Elements of Narrative* (158)

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INTRODUCTION

Nexus of Narrative and Mind

In a society saturated with stories, narrative plays the critical role of enabling us to comprehend and navigate the human experience. As a tool for understanding, narrative is fundamental to human cognition and yet, what happens to the mind when reading narratives, particularly fiction and nonfiction, remains unclear. Despite this research gap, a wealth of theory and growing empirical evidence strongly indicate that reading activates a simulation with critical cognitive and emotional components. Importantly, these components have been linked to prosocial cognition, specifically the ability to take the perspective of another and empathize with the other[1].

Perspective taking, or Theory of Mind,[2] and empathy are crucial prosocial skills in a world riddled with dangerous biases, rife with complex social relationships, and one that seems increasingly divisive. In such a world, stories possess untapped power. In a seminal work, David Herman (2009) identifies this power as the nexus of narrative and mind because in reading stories, readers gain access to experiences *and* the conscious minds behind those experiences, which would otherwise be unattainable. Because of narrative's aptitude to establish mental simulations in which readers can immerse themselves, "stories, and stories alone, afford an environment in which versions of what it was like to experience situations and events can be juxtaposed, comparatively

[1] "The other" is meant in its relation to the concept alterity, understood as the state of being different. Otherness is mutually constituted between two subjects.

[2] Theory of Mind is used in its psychological definition throughout this thesis, as the ability to both recognize that others have different mental states—thoughts, beliefs, intentions and so forth—than oneself, and to attribute those mental states to others. Theory of Mind will be used interchangeably with perspective taking. The term, and its relationship to parallel concepts in narrative theory, will be further explicated in Chapter 3.

evaluated, and then factored into further accounts of the world (or a world)" (Herman, 2009, p. 151).

Thus, arises the claim that reading, and especially reading fiction, can improve a reader's ability to understand and empathize with other human beings. Such a conception of the cognitive value of fiction is enticing on many levels and has been taken up by several narrative theory scholars to varying degrees (Fludernik, 1996, 2003; Zunshine, 2006; Keen, 2007; Herman, 2009; Nunning, 2015). The fundamental concept of fiction as simulation can even be traced back to Aristotle in the *Poetics* writing about *mimesis*, which meant "world-making" or "modeling" (Djikic et al., 2013). Certainly, the culmination of these ideas has evolved into enticing theories for the potential of narrative to benefit a reader's prosocial cognition, but these theories necessitate more convincing argumentation.

The notion that the act of reading functions as a simulation, with potential cognitive benefits, is not unique to literary scholarship, however. In fact, what Herman terms the nexus of narrative and mind exists pervasively in cognitive science research as well. Keith Oatley (2012), when arguing that reading fiction improves readers' empathy and perspective taking in "The cognitive science of fiction," states:

> The most important discovery in cognitive science is that the mind makes models of the world. These models are the mind, and planning depends on them. The cognitive science of fiction augments this idea … It is about how minds can enter these models, and thereby understand more about other people and themselves, perhaps enabling them to be more conscious, and more planful, in interactions with others. (p. 425)

Oatley, a cognitive psychologist, along with psychologist Raymond A. Mar, conducted some of the initial empirical studies exploring the cognitive processes underlying reading stories, which has also led them to contend reading can benefit a reader's prosocial

cognition because "[n]arratives are fundamentally social in nature in that almost all stories concern relationships between people: understanding stories thus entails an understanding of people and how their goals, beliefs and emotions interact with their behaviors" (Mar et al., 2006).

Research across these disciplines converges on the concept that reading entails a simulated experience. However, exactly how this simulation works, and under what conditions reading stories leads to improved prosocial cognition, remains understudied despite the prevalence of claims. Thus, this thesis aims to fill gaps in the research by more closely parsing the underlying processes of narrative engagement by specifically investigating the role of genre expectations on measurements of prosocial cognition and transportation.[3]

What Makes Fiction Special?

With the guidance of narrative theory and empirical insights from cognitive psychology, an empirical study was conducted to explore how fiction and nonfiction genre expectations influenced the following constructs: transportation, empathy, and perspective taking. Research in cognitive psychology has shown genre expectation influences how readers allocate cognitive processing resources when reading a text. Narrative theory, premised on the assumption that narrative is an inherent human capacity that enables us to understand fundamental aspects of the human condition and

[3] Transportation, understood as immersion in a storyworld, is a key construct stemming from psychology (Richard Gerrig, 1993) and is thought to be connected to narrative simulation. Transportation will be addressed in Chapter 3. Current empirical work assumes some combination of relationships between transportation, empathy and theory of mind, but those relationships have not been adequately determined. Rather, existing studies often make the assumption that transportation is either the equivalent of perspective taking, or a necessary precondition that enables perspective taking, which leads to empathy. An important distinction made in the study presented in this thesis is that it challenges that assumption.

our experiences, has long-standing theoretical claims positing that reading fiction increases empathy and boosts the likelihood of perspective taking among individuals.

Recent research in the field that combines these empirical and theoretical disciplines, cognitive narratology, has also exposed a genre effect and provided some support that fiction is linked to improved empathy and theory of mind skills. However, existing empirical work is very new, exploratory, and at times conflicting. Thus, more research is needed to better understand the relationship between reading narratives – fiction and nonfiction – and their potential relationship to prosocial cognition, empathy and theory of mind. The experiments conducted as a component of this thesis aim to be a contribution to the field of cognitive narratology, an interdisciplinary endeavor with a foundation that integrates narrative theory, literary studies, and cognitive science. By taking an integrated approach to investigate the underlying processes of narrative engagement, the research in this thesis aims to clarify the following research questions: What is the potential of narrative simulations to increase prosocial cognition, and how does that potential differ between fiction and nonfiction? And what exactly accounts for those differences? Engaging with these questions not only contributes to identifying the potential benefits of reading narratives, but also launches a much more rigorous analysis of narrative conventions and how they interact with the reader aesthetically *and* cognitively.

Untapped power: educational, cultural and social implications

If theory of mind and empathy are products of reading fiction, or a function of reading narratives in the proper circumstances, the most immediate benefit is that educators and scholars can make the case to key constituents that reading literature can

enhance the ability of individuals to take the perspective of others and increase their likelihood of empathizing with others. Therefore, it would be very beneficial to know what kinds of narratives provide this benefit, and how they do so.

Beyond the more immediate benefit of increased ability to understand others' perspectives and empathize, expanding this line of research "is a step toward showing that fiction is a valid, epistemologically sound, enterprise," (Oatley, 2012, p. 428). Considering that the importance of reading literature and a healthy literary culture has been increasingly under attack, it is essential that the humanities bolster their defenses with empirical evidence. This is especially important because the devaluing of the humanities has real-world impact on policy decisions, educational settings and larger cultural trends. The Common Core State Standards for instance advocate for "less emphasis on fiction in secondary education" (Kidd & Castano, 2013, p. 380).

Furthermore, the untapped potential of fiction to change readers' beliefs, including negative biases, warrants thorough investigation (Nunning, 2015). The persuasive power of fiction to change readers' beliefs and self-concepts needs to be taken seriously. "Contrary to prevalent beliefs, even 'untrue,' fictional stories, can change readers' beliefs and their cultural encyclopedia," (Nunning, 2015, p. 42). Some studies in this line of research have shown that the act of reading fiction changes self-reports of personality. Other studies have shown that participants learned about real-world items and information in a fictional setting, and then applied that knowledge in a real-world setting. First, this suggests the possibility that repeated interaction with fiction could have both short-term and long-term effects on an individual's selfhood and general world knowledge. Secondly, and more importantly, there is untapped potential for researchers

and scholars to find ways to utilize literary narratives strategically to encourage desirable changes in an individual's selfhood or knowledge.

The better we understand how processing narrative works, the closer we arrive at devising a toolkit of narrative strategies to improve educational outcomes that have broader social and cultural benefits. Expanding the knowledge of narrative simulation and the effect of genre expectations not only has educational implications, but presents opportunities for researchers in fields like conceptual change, to develop successful strategies that replace an individual's misconceptions with the correct conception. Such efforts have never been more important as we witness the rise of fake news[4], which often encourages biases toward 'other' groups, and misinformation about critical topics, such as climate change and vaccines, in the digital age.

[4] Fake news refers to intentional and manufactured information that is falsely presented to the reader as true, stemming from websites falsely representing themselves as legitimate news outlets, from social media, or online peddlers of conspiracy. A prime example of fake news, how it originates and persists, as well as its dangerous consequences, is the story of Pizzagate (October - December 2016). Pizzagate even earned an entry on Wikipedia as the "Pizzagate conspiracy theory."

CHAPTER 1: WHEN THE NARRATIVE TURN AND COGNITIVE TURN COLLIDE

Although stories have long been the object of scholarship in literary studies, the concept of narratives as a fundamental tool for sense-making is relatively new as an object of serious study. As David Herman writes in the Introduction to *Narrative Theory and the Cognitive Sciences* (2003), "Theorists' recognition of the vital role played by stories in our everyday lives is both a cause and a byproduct of the development (one might say explosion) of new approaches to narrative analysis," fostered by the 'narrative turn' (p. 4). The functional result of the 'narrative turn' over the last few decades was that narrative "became a central concern in a wide range of disciplinary fields and research contexts" (Herman, 2003, p.4), especially in the cognitive sciences. In parallel, narrative scholars in the humanities became more open to integrating approaches from the cognitive sciences due to the 'cognitive turn' in narrative studies forms/emerges in the 1990s.[5]

[5] The integration of narrative studies and cognitive sciences during this period is evidenced by the emergence of early key works, journal issues dedicated to cognitive narratology, and has been followed by a steady stream of articles and conferences "exploring intersections among cognition, literature, and culture as well as approaches to the mind-narrative nexus in particular" (Herman, 2013, para. 4). An incomplete list of examples includes: 1) Key works – *Possible Worlds, Artificial Intelligence, and Narrative Theory* (Marie-Laure Ryan, 1991), *Reading Minds: The Study of English in the Age of Cognitive Science* and *The Literary Mind* (Mark Turner, 1991 and 1996), *Towards a 'Natural' Narratology* (Monika Fludernik, 1996), *Narrative Theory and the Cognitive Sciences* (e.d., David Herman, 2003); 2) Journals – the very first volume of *Image and Narrative* in 2000 entitled "Cognitive Narratology" features an article by David Herman, "Narratology as a cognitive science"; a 2002 special issue of *Poetics Today* entitled "Literature and the Cognitive Revolution"; a search for the term "cognitive" in the major journal *Narrative* pulls up 138 results ranging from 2002-2017; 3) Conferences – Science of Story and Imagination: Perspectives from Cognitive Science, Neuroscience, and the Humanities (March 2014), Why the Humanities: Answers from the Cognitive and Neurosciences (July 2015), Perspectives and Frontiers of Cognitive Narratology (October 2015); Narrative, Cognition & Science Lab (August 2016). At the 2017 International Conference on Narrative, there was a cognitive presence throughout the program, importantly marked by starting the conference with cognitive-oriented talks for the initial conference kick-off panel (Contemporary Narrative Theory I with speakers, Marco Carraciolo, Mark Currie and Karin Kukkonen), included the following panels: Empirical Research on Narrative, Cognitive Approaches to Narrative, Character, Cognition and Representation, and featured individual papers on other panels incorporating cognitive approaches in some capacity.

A critical outcome that arises from the development of cognitive narratology is an interdisciplinary framework that understands "stories as both a major target of and an important basis for cognition" (Herman, 2003, p. 12). This approach incorporates two perspectives on the relationship between narrative and cognition—making sense of stories and stories as sense-making. When using this approach, the study of narratives no longer solely aims to advance knowledge of their form and function and how those factors establish meaning for the reader, nor does it do so in the isolation of literary studies. Rather, the study of narratives in the framework of cognitive narratology seeks to discover both the cognitive processes underlying how we make sense of stories *and* how we use stories as "an instrument for sense-making, a semiotic and communicative resource that enables humans to make their way in a sometimes confusing, often difficult world" (Herman, 2003, p. 12).

Cognitive narratology entails an enticing and fruitful research approach to the study of narrative. But once we recognize stories function as a tool for sense-making, complex questions arise: How exactly do narratives accomplish such a feat and what happens cognitively when they do? Across disciplines, the answers to the question to this question converge on one key concept – simulation.

Reading Minds, Insights from Literary Scholars

Though she does not use the term 'simulation', Monika Fludernik (1996) introduces the term 'experientiality,' which she defines as "the quasi-mimetic evocation of real-life experience" (p. 12). In other words, experientiality is an outcome of reading (certain) narratives that contain representations of human experience such that they activate "'natural' cognitive parameters, particularly the embodiment of cognitive

faculties, the understanding of intentional action, the perception of temporality, and the emotional evaluation of experience" (Caracciolo, Experientiality, para. 1). To clarify her definition of experientiality as "the quasi-mimetic evocation of real-life experience," Fludernik informs the reader that:

> …mimesis must *not* be identified as imitation but needs to be treated as the artificial and illusionary projection of a semiotic structure which the reader recuperates in terms of a fictional reality. This recuperation, since it is based on cognitive parameters gleaned from real-world experience, inevitability results in an implicit though incomplete homologization [sic] of the fictional and the real worlds. (1996, p. 35)

Put simply, readers project a simulation of a storyworld and that storyworld's characters and events in order to process the narrative cognitively using the same cognitive faculties they use on a daily basis in real life storytelling environments.

Furthermore, Fludernik argues experientiality is the "crucial ingredient" that constitutes narrativity. In making this claim, Fludernik means that the quality that makes a narrative *explicitly* a narrative, as opposed to another form of discourse, does not reside in the text contents or features of the text, but is "rather an attribute imposed on the text by the reader who interprets the text *as narrative*, thus *narrativizing* the text" (Fludernik, 2003, p. 244). In this process, what matters most is "the protagonist's emotional and physical reaction to [events as they impinge on her situations and activities]…since humans are conscious thinking beings, (narrative) experientiality always implies – and sometimes emphatically foregrounds – the protagonist's consciousness" (1996, p. 30).

In the context of this thesis, Fludernik makes two key contributions. First, she situates her claims about a reader's experience with narrative in terms of a reader's "natural" cognitive capacities, which dovetails into the second contribution. By establishing 'experientiality' as a cognitive process, Fludernik links a reader's

consciousness to representations of consciousness in narratives. In doing so, she suggests that reading activates some type of simulated experience for the reader and that this simulation depends ultimately, on the reader rather than the text.

Fludernik's ideas about experientiality remain pervasive and influential. Although she did not explicitly link experientiality to simulation, her theoretical contributions about the role of consciousness provided fertile ground for other scholars to extend her concept of experientiality closer to how it is understood in psychology, "as narrative's capacity to give rise to experiential states and responses in recipients. Experientiality thus ties in with a larger movement within contemporary narratology—a movement that focuses on the psychological processes underlying recipients' engagement with stories" (Caracciolo, para. 13).

Herman contributes to this extension in the *Basic Elements of Narrative* (2009), in which he argues "narrative is a mode of representation tailor-made for gauging the felt quality of lived experiences" (p. 137-138). Building from Fludernik's conception of experientiality, Herman draws on philosophy of mind's notion of qualia[6]—a quality of human consciousness that specifically accounts for the feeling of "what it is like" to be someone or something (p. 143)—to argue that narrative and qualia are structurally isomorphic. A condition of narrative is the representation of characters' consciousness, i.e., their qualia, and by representing minds, "stories emulate through their temporal and

[6] The term qualia is a storied concept that stems from philosophy of mind. For the current purposes, it is best understood as a term referencing "the qualitative, experiential, or felt properties of mental states" (Levin, 1999, p. 688). In other words, it refers to subjective conscious experiences and is used accordingly in this thesis. It is beyond the scope of this thesis, however, to delve into philosophical conversations and debates about qualia in the specific context of philosophy of mind.

perspectival configuration the what-it's-like dimension of conscious awareness itself" (p. 157). Herman therefore makes the following statement:

> Stories […] do not merely convey semantic content but furthermore encode in their very structure a way of experiencing events. To put the same point in other terms, narrative, unlike other modes of representation such as deductive arguments, stress equations, or the periodic table of the elements, is uniquely suited to capturing what the world is like from the situated perspective of an experiencing mind. (p. 157)

This is where Herman makes a distinctive and an important departure from Fludernik, and lays the groundwork for linking the reading of narrative to simulation.

Beyond the claim that the structure of real-life qualia maps onto the structure of stories, and that stories represent qualia, Herman claims that narrative actually allows the reader to engage with the qualia, to in fact know the subjective conscious experiences, of characters in their respective storyworlds. Furthermore, this engagement enables readers to compare "versions of what it was like to experience particular situations and events," which means that "narrative not only reflects but helps shape the sense of what it is like to live through worlds-in-flux" (p. 152). However, Herman stops short of stating that readers "experience" the qualia of characters in storyworlds during reading.

In another step toward connecting the reading experience to simulation, Marco Caracciolo puts even more weight on the reader's consciousness in the process of reading than Herman. "His central claim is that the consciousness the reader 'finds' in narrative texts is not represented or projected but *enacted* in the reader's imagination" (Bernaerts et al., 2013, p. 15, emphasis mine). In line with Herman, Caracciolo also argues narratives present opportunities to understand the mental states of others. However, Caracciolo departs from Herman in two important ways.

First, Caracciolo elevates the role of imagination in the reader's experiencing of fictional minds and second, he is more willing to argue that literary fiction specifically accomplishes this feat. From this position, Caracciolo suggests that "fiction can make empathic identification much stronger than it usually is in our engagement with other people, for the simple reason that we do not just 'put ourselves into the shoes' of another; we imaginatively reconstruct those shoes (and, for that matter, the other person) on the basis of textual cues" (2013, p. 48). For Caracciolo then, narratives do not just provide readers access to viewing fictional minds and their qualia, but narratives, and literary fiction especially, actually enable readers to share the experiences of those fictional minds and their qualia by enacting them. Furthermore, Caracciolo ties a reader's simulation of fictional minds to empathy, a critical point that will be discussed in detail in upcoming chapters.

In another key contribution to the concept of narrative simulation, Liza Zunshine (2006) integrates research from cognitive psychology on Theory of Mind, or mind-reading. Mind-reading is the cognitive skill that allows us to ascribe mental states, such as thoughts, feelings, and beliefs, to others. This ability helps us understand how and why other people act the way they do. As Zunshine writes, "attributing states of minds is the default way by which we construct and navigate our social environment, incorrect though are attributions frequently are" (p. 6). In *Why We Read Fiction: Theory of Mind and the Novel*, Zunshine showcases how closely integrated mind-reading is to literature, such that "literature pervasively capitalizes on and stimulates Theory of Mind mechanisms that had evolved to deal with real people, even as on some level readers to remain aware that fictive characters are not real people" (p. 10). With multiple detailed case studies,

Zunshine convincingly demonstrates this link by bringing to light the relationship between metarepresentation, ToM, and literature. Metarepresentation entails tracking the sources of representations; Zunshine refers to this as tagging. Where ToM enables us to identify, or hypothesize, about the mental states of others, metarepresentation aids us in tracking multiple, and sometimes contradictory information inputs about an individual. Therefore, Zunshine writes:

> Broadly speaking, whereas our Theory of Mind makes it possible for us to invest literary characters with a potential for a broad array of thoughts, desires, intentions, and feelings and then to look for textual cues that allow us to figure out their states of mind and thus predict their behavior, our metarepresentational ability allows us to discriminate among the streams of information coming at us via all this mind-reading. (p. 60)

In the context of reading literature, a reader is presented with multiple metarepresentations—characters thoughts about other characters—and is tasked with arriving at the proper conclusion about the characters in the story. Though she does draw strong connections between these cognitive skills and literature, Zunshine's project is focused on how these cognitive skills inform reading literature, not the other way around. She cautions that while, "Theory of Mind makes reading fiction possible, reading fiction does not make us into better mind-readers, at least not in the way that I can theorize confidently at this early stage of our knowledge about cognitive information processing" (p. 35). Yet, her project underscores the potential of literature to exercise our mind-reading abilities.

Narratives as Social World Simulations, Insights from Cognitive Psychology

While literary scholars have long theorized about the relationship between fictional minds and actual minds with a particular focus on issues pertaining to consciousness and (increasingly) text features, until very recently, they have edged

around, and often stopped short of, the claim that reading certain narratives can enact a simulated experience for the reader. Scholars from psychology and cognitive psychology, on the other hand, have not shied away from claims about the connection between narrative fiction and simulation.

A 2008 article in the *Perspectives on Psychological Science*, "The Function of Fiction is the Abstraction and Simulation of Social Experience" (Mar & Oatley), offers a prime example. Mar and Oatley (2008) write:

> Simulation is related to narrative fiction in two distinct ways. The first is that consumers of literary stories experience thoughts and emotions congruent with the events represented by these narratives. […] The second way in which literary narratives are related to simulation is that stories model and abstract the human social world. (p. 173)

In a shift from the literary scholars discussed above, Mar and Oatley move away from theoretical discussions and posit a direct claim about the "function of fiction." This perspective on narrative fiction has influenced cognitive psychology's research about narrative comprehension quite extensively. For instance, the authors of a foundational study in cognitive narratology, "Reading other minds: Effects of literature on empathy" (2013), contend that:

> Fiction has the general subject matter of selves in the social world. It is in the narrative mode, and is about intentions and the vicissitudes they encounter. It is emotionally engaging and encourages identification or experience-taking. It is based on a simulation that the reader runs in his or her mind. The theory of fiction as simulation of selves and their interactions in the social world is supported by several lines of evidence (Djikic, Oatley, & Moldoveanu). (p. 34)

The conviction behind these statements stems from a platform of pivotal theoretical contributions, especially Jerome Bruner's (1986) *Actual Minds, Possible*

Worlds and Richard Gerrig's (1983) *Experiencing Narrative Worlds*.[7] After all, Bruner (1986) was the first to make the claim that narrative "deals with the vicissitudes of human intention" (p. 13); the use of "vicissitudes" is now commonplace in this literature rather than more accessible alternatives, like variations or fluctuations. Of greater importance, when Bruner (1986) argued that the main role of narrative is to mediate human experience, he made a critical contribution to how scholars think about narrative by conceiving of narrative as a mode of reasoning, sense-making, and as tool for creating one's self identity (Mattingly, Lutkehaus & Thropp, 2008).

Bruner (1986) posited that two modes of thought direct human cognition – the narrative mode of thought and the paradigmatic, or logico-scientific, mode of thought. He specifically links the narrative mode of thought to humans' "primitive propensity to interpret behavior in terms of intention" (Mattingly, Lutkehaus & Thropp, 2008). Essentially, humans seek causality, which means we narrativize everything by trying to ascertain or ascribe intention to other humans or whatever subjects/objects exist in the world. In the narrative mode of thought, we use stories to understand and interpret the world, other humans, and our subjective experiences; it is how we extract meaning.

In contrast, the logico-scientific mode of thought is linked to the testable empirical world, formal and logical categorization. In the logic-scientific mode of thought, our goal is not extract meaning, but to extract information. This distinction becomes particularly salient in distinguishing the reading goals of fiction and nonfiction.

[7] Gerrig's contribution, primarily the concept of narrative transportation, will be further discussed in the next chapter due to its direct influence on empirical studies on narrative comprehension.

Fiction communicates meaning, the meaning that others[8] have constructed through their experiences, via an interpretable narrative. Nonfiction communicates information.

According to Bruner (1986), these two modes of thought, or "cognitive functioning," provide "distinctive ways of ordering experience, of constructing reality" and "each of the ways of knowing, moreover, has operating principles of its own and its own criteria of well-formedness" (p. 11). The distinction between the narrative and logico-scientific mode of thought was later applied to investigating the differences in how readers process fiction and nonfiction. Zwaan (1994) examined the effects of fiction and nonfiction genre expectations on text comprehension and found that the genre expectations influenced how readers processed texts resulting in the formulation of different mental representations. These findings suggest that readers comprehend texts according to which mode of thought is activated.[9] On top of the major contribution about two modes of thought, Bruner (1986) also sets fiction aside as special. In addition to having content that parallels the social world, the presence of (character) consciousness, literature also presents potentials outside of everyday reality.[10] "Stories, in other words, present the world not as it necessarily or always is, as settled facts, but as 'psychologically in process, and as such, contingent or subjunctive'" (Mattingly, Lutkehaus, & Thropp, 2008, quoting Bruner, p. 29). In doing so, stories act like case studies for humans to practice their narrative mode of thought and learn from.

[8] Without delving into the complexities implied here, others can refer to fictional characters, narrators, and authors.
[9] Zwaan's (1994) study will receive more attention in the following chapter, including how it influenced the experiments conducted in this thesis.
[10] The parallels between Bruner and literary theory scholars, especially David Herman, are striking here.

For scholars based in psychology and cognitive science, the link between reading narrative and simulation was also primed by a robust and extensive line of established research on text comprehension processes that strongly indicates readers develop mental representations of a text's meaning during the reading process (Kintsch & van Dijk, 1978; van den Broek et al., 1999) which includes automatic and "conscious intentional and strategic processes" (Mar & Oatley, 2008, p. 172; referencing Kintsch, 2005; van den Broek, Rapp, & Kendeou, 2005). Furthermore, text comprehension research has also revealed differences in the processes readers apply to narrative fiction texts versus expository nonfiction texts (Zwaan, 1994), a finding that is pivotal for the research conducted in this thesis, which specifically investigates the role of fiction and nonfiction genre expectations on narrative comprehension processes.

Converging on Narrative Simulation

It is telling that scholars across disciplines, all studying how narratives function but within the scope of their respective discipline's research and theories, made contributions that converged on the fundamental idea that narrative entails some sort of simulated experience for the reader. The humanities focused on theoretical questions: What makes narrative distinctly narrative? What role does the reader's consciousness play? What aesthetic qualities of the text, like point of view or the use of free indirect discourse, influence a reader's experience of the text? In contrast, but certainly in complement, cognitive psychology centered its inquiry on mechanistic questions: How does narrative comprehension work? How does a reader establish a mental model or representation of a text (Bortolussi, Dixon, & Sommer, 2016)?

Insights from the humanities illuminated the role of qualia, and its relationship to the structure of narrative, while contributions from the cognitive sciences drew out the parallels between a reader's cognitive capacities in daily storytelling environments and processing narrative texts. As the connection between fictional minds and actual minds becomes increasingly evident, new and more complex questions arise, however.

Thankfully, the integration of these disciplines, i.e., cognitive narratology, opens up space for the research conducted in this thesis. Applying empirical approaches to the study of narrative is an opportunity, but one best served with adherence to and awareness of the contributions from literary theory scholars. As Bortolussi, Dixon, and Sommer, (2016) write in the Introduction to a special issue of *DIEGESIS* (5.1, 2016) entitled "Empirical Approaches to Narrative", the exploration of "how interpreters make sense of stories and how specific narrative designs cue readers to respond to texts in predictable ways…is a truly interdisciplinary project that calls for close collaboration between narrative theory, especially the domain of literary [cognitive] narratology, and the methodologies of cognitive psychology and discourse processing" (p. 1).

This interdisciplinary framework provides a better position for this thesis to ask the following questions: What factors influence the cognitive processing of stories? Specifically, does genre expectation matter and how so? What are the cognitive outcomes of reading fiction versus nonfiction?

CHAPTER 2: STATE OF EMPIRICAL RESEARCH

The theoretical convergence on the idea of narrative simulation led to a surge of interest across disciplines in investigating how reading fiction functions, and this has resulted in a burgeoning line of empirical research. In this body of research, three key themes can be identified. First, the emergence of critical studies on the underlying cognitive processes and subsequent outcomes of reading narratives has typically assumed fundamental differences exist between fiction and nonfiction stories and those differences facilitate distinct processing. Second, the constructs—transportation and Theory of Mind, or perspective taking—that have been theorized as components of simulation have received the most attention. Third, the notion that fiction operates differently than nonfiction has fueled ideas about the potential cognitive benefits of reading fiction, primarily empathy. The following discussion of key findings in this body of research highlights how researchers have worked within these themes to explore what narrative simulation entails.

Fiction vs. Nonfiction—Two levels

The "literariness" of fiction in comparison to nonfiction almost seems implicit, but as suggested above, there are distinctive features in a literary reading experience versus a nonfiction one. According to David S. Miall (2009), "there are two standard claims about what makes our reading literary: that it is triggered, first, by our encounter with a rich, organized array of stylistic features (Miall & Kuiken, 1999), or, second, by the (usually empathic) engagement with characters in literary narratives (Oatley & Mar, 2005)" (p. 235). In the chapter, "Neuroaesthetics of Literary Reading," Miall emphasizes the reader's unique aesthetic experience of fiction in the context of recent advances in

neuropsychology that explore real-time online processing of narratives through brain imaging studies. Given the progress of studies in this field and advances in the technology, Miall contends "the fine discrimination of literary from nonliterary experience should now be within reach of brain scanning technology" (p. 236). Though enthusiasm about these advances may be warranted, this is a significant claim to make, and one which should raise eyebrows and a lot of questions. Seeing parts of the brain light up tells us something certainly, but only generally, about narrative processing; neuroimaging remains severely lacking in specificity, a limitation Miall recognizes when he asks, even "if we find a difference due to literary processing, can we understand what it means, that is, how it contributes to a conception of literariness?" (p. 237). Well, maybe he contends, *if* we take an interdisciplinary approach that also entails identifying core features specific to fiction and isolating their effects. The empirical studies that have waded into research questions about processing fiction versus nonfiction are a step in the right direction, but Miall's point is an important one for the field as it moves forward. If we are to truly capture "what is distinctive to literary response" in a reader's cognitive processing of fiction compared to expository texts, we need to approach the difference between fiction and nonfiction at two levels—how we cognitively process the two genres, *and* how the content and its features moderate that processing.

Recall from the last chapter the distinction Bruner (1986) made between two modes of thought, or "two modes of knowing" – the logico-scientific mode and the narrative mode. In doing so, Bruner brought to light an important aspect of how humans deal with the varied influx of information they encounter on a daily basis. As Bruner writes, "There are two modes of cognitive functioning, two modes of thought, each

providing distinctive ways of ordering experience, of constructing reality. The two (though complementary) are irreducible to one another" (p. 11). Essentially, we have cognitive strategies, or frameworks, that we apply depending on the material we encounter. In the logico-scientific mode of knowing we order truth by logic, causality, testable hypotheses—essentially facts and information about the empirical world. The narrative mode speaks to our subjective state of being and supplies a way of understanding our experiences with the empirical world as well as other humans and their actions.

Not only do we have two modes of thought, the information generated by these two modes then gets compiled in certain formats, a process which inherently causes them to be designated as one of two categories—fiction or nonfiction. In these two modes of cognitive functioning we produce different ways of knowing and subsequently, different products. Bruner (1991) writes, "unlike the constructions generated by logical and scientific procedures that can be weeded out by falsification, narrative constructions can only achieve 'verisimilitude.' Narratives, then, are a version of reality whose acceptability is governed by convention and 'narrative necessity' rather than by empirical verification and logical requiredness…" (p. 4).

The parallel distinctions of the logico-scientific mode and narrative modes of thought, and nonfiction and fiction discourse or texts, thus provide a fruitful starting point for empirical studies on text and discourse processing. The result is a two-tiered concept of, to use Bruner's words, verisimilitude; we apply different standards of truth to each of these modes. If we process information differently depending on our cognitive

framework, then it follows that different mechanisms are at play depending on the mode we apply, or the mode that the text facilitates.

Rolf Zwaan (1994) explored this possibility in "Effect of Genre Expectations on Text Comprehension." In this set of experiments, Zwaan split participants into two groups that read the same text materials, but were either told it was a literary story or a news story. With this instruction manipulation, Zwaan investigated whether the discourse genre would influence the process and products of text comprehension; "given that reader goals affect mental representations and that there are three levels at which text can be represented, one may assume that readers will, depending on their goals, differentially allocate resources to processes that construct these levels during reading" (p. 920). Zwaan was specifically attending to comprehension processes in this study, hence his focus on the three levels of discourse comprehension—surface structure, textbase, and the situation model (Kintsch & van Dijk, 1978).

By giving participants the same text to read, but changing the genre identified, any differences captured in comprehension measurements could be "attributed to differences between a news- and a literary-comprehension control system rather than to particular text features or to a reading goal explicitly provided by the experimenter" (p. 921). What Zwaan refers to as news- vs. literary-comprehension control systems, we can read as Bruner's logico-scientific mode vs. narrative mode of thought. In these two experiments, the results indicated the participants did formulate different mental representations of the text and allocate processing resources differently depending on their genre expectation; differences were identified in post-reading measures on comprehension and memory of the text at the three discourse levels identified earlier.

While participants in both categories within the experiment, or conditions, performed equally well on basic comprehension of the text, participants "reading under a literary perspective had longer reading times, better memory for surface information, and a poorer memory for situational information than those reading under a news perspective" (p. 920). In other words, participants allocated cognitive processing resources differently because the genre expectation they had established the "verisimilitude" they were seeking and the corresponding genre standards for said truth. Thus, participants in the news reading condition spent more time on forming a causality-coherent situation model, and participants in the literary condition spent more time on the surface structure, seeking meaning from the text structure itself, rather than information to check against and fit into their knowledge of the real world**.** As Zwaan hypothesized, the study "suggests that information about text genre triggers strategic processes in reading" (p. 931).

However, we must remember that discourse processing remains a two-way interaction between the reader and the text.[11] While the notion that readers activate a different processing framework when reading fiction has received some empirical support, these studies have limitations[12] and the authors are certainly not making the claim that the text contents and structure do no matter. But the question becomes, how much do they matter and what features of fiction actually accomplish these effects? From

[11] This statement rests on well-established understandings of how a text's meaning depends on an interaction between the text and the reader, which is robustly supported by reader-response theories (see Stanley Fish, *Is There a Text in This Class?* (1980), and Wolfgang Iser, *The Implied Reader (1972)* and *The Act of Reading* (1978)). The basic idea behind reader-response theories is that the texts contain gaps and the reader is tasked with filling those gaps to establish meaning, based on cues from the text *and* from what they bring to the text, such as prior knowledge. The influence of reader-response theory in discourse processing research (i.e. situation models and schemata) is prevalent, providing another example of disciplinary crossover between literary theory and cognitive psychology in the context of the reading experience.

[12] To be discussed in next chapter.

this discussion, it may seem that fiction is not that special after all, but fiction is clearly distinctive from nonfiction.

The experience of reading a piece of literature, especially an engaging one, is vastly dissimilar from reading newspaper articles about plights around the world; we know this from repeated personal experience. When I read that Dumbledore—a wizard from not just a fictional storyworld, but a hyper-fictionalized one at that—died, I was genuinely emotionally upset. I had to stop reading. My mom did not understand my sudden mood change, as I went from walking around reading voraciously to being teary-eyed and tossing the book on the kitchen counter in disbelief and grief. And yet, I read the news every day in which real deaths are narrated. But when I read another story about civilian deaths in a war-torn locale, or the state of the refugee crisis in Syria, I just keep reading. I simply switch tasks and move on to the next headline. There is a moment at times when I experience a cognitive, or conscious, recognition that this story upsets me, but it is (in a troubling way) a fleeting perception that occurs before I move on to the next story. Though perhaps I should not say it upsets me at all really because upon further thought, that fleeting perception is more akin to knowing something is wrong, rather than feeling the depths of that wrongness in an experiential and emotional way, which contrasts how I feel when reading *Harry Potter,* or Michael Chabon's *The Amazing Adventures of Kavalier and Clay,* or John Steinbeck's *Grapes of Wrath.* In reading those stories I become emotionally entangled with the characters' experiences as a co-experiencer. The palpable distinction between the experience of reading fiction versus nonfiction is compelling, even in the brief case sketched above, but the reasons for the difference are complex.

Reading fiction certainly *feels* different, but there are also important technical reasons for this as well. First, to state the obvious, fiction entails imaginary worlds created by a writer's imagination; even if you read a realist novel that correlates strongly to the details of our world and how it works, the story remains anchored in fantasy. Fiction narratives do not present an account of reality, but a representation of it, whereas nonfiction narratives deal with real world content, real people, real facts. Second, fiction tends to incorporate figurative language, while nonfiction rarely does. Third, fiction uses genre-specific devices, such as free indirect discourse, multiple points of view, narrators, defamiliarization, and internal monologue, just to name a few.

Recognizing these two levels of difference between fiction and nonfiction is a core component of the foundation for research in cognitive narratology. From this distinction, we can explore the mechanisms that underlie narrative processing and simulation, as well as the differences in the outcomes of reading fiction versus nonfiction.

Components of Simulation—Transportation and Perspective Taking

Richard Gerrig (1993) establishes the theory of narrative transportation in his work, *Experiencing Narrative Worlds: On the Psychological Activities of Reading*. The core of this concept speaks to the feeling of "getting lost" in a story, to the extent that real world surroundings are no longer at the forefront of an individual's thoughts and are, essentially, forgotten. When this happens, to varying degrees, a reader is immersed in a narrative and becomes transported into the storyworld of the narrative they're engaging with; though Gerrig claimed transportation can occur readily in a wide range of narrative experiences, the research so far supports the idea that transportation is more prevalent in fiction than nonfiction reading processes. Regardless, ever since Gerrig hypothesized the

same cognitive mechanisms are behind how we process narratives *and* how we process the day-to-day real world, and that readers could be "transported" into fictional worlds in a way that leads them to emotionally engage and react mentally to that world, the concept of transportation has been linked to almost all potential outcomes of reading fiction (Mar et al., 2006).

Though Gerrig's idea became highly influential, he was not particularly explicit about how transportation took place. In fact, he wrote:

> "…little is formally required to bring about experiences of narrative worlds: the means are quite diverse and sometimes mundane. Great artistry might facilitate the journey, but the only a priori requirement for a means of transportation is that it serve as an invitation to the traveler to abandon the here and now. (In terms of our metaphor, I'm claiming that a pickup truck isn't as elegant as a Cadillac, but it will still get us to Texas.) (p. 12)

This underwhelming general description of the factors involved in transportation left ample room for researchers to expand the concept, both in terms of what facilitates a reader to be transported and what a reader does once in this immersed state. Narrative transportation is now typically conceived of as a multidimensional concept, which occurs on a low-high spectrum that depends on how good a reader's mental image of the storyworld is, and the degree to which a reader becomes emotionally involved in the narrative (Green, 2004). Though there is some support for the claim that high levels of imagery invite mental simulation and immersion, the factors that influence the level of a reader's transportation into narrative remain largely up for debate.

Despite these unknowns, transportation is now considered a key mechanism of narrative impact (Green & Brock, 2000), a claim that entails an assumption that transportation either induces or entails cognitive outcomes, such as empathy and perspective taking. The concept has become so prevalent among researchers in cognitive

psychology that "the phenomenology of transportation is taken to be a *fact* of readers' immersion" (Keen, 2013, para. 4). The literature so far indicates that "the persuasive effect of fiction is only likely to be realized if fiction is read as fiction, that is if it is not processed in the same way as a factual story or textbook. The persuasive power of fiction is tied to transportation, which presupposes that fiction is read as an end in itself, for pleasure, in a state of immersion, with the reader being entranced by the fictional world" (Nunning, 2015, p. 44).

In addition, the notion that transportation enables empathy has received some experiment support. Bal and Veltkamp (2013) tested the hypothesis that reading fiction influences empathy, and that those empathy outcomes are directly correlated to the level of transportation readers experience. In their study, participants either read a fiction chapter or newspaper articles. Overall, participants in the fiction condition reported enhanced empathy, but only when they experienced high levels of emotional transportation. Of note, this enhancement held over a week period, which suggests that engaging with certain narratives does not just have temporary effects on a reader, but potentially long-term ones as well.

In the first study to consider the moderating role of transportation, Bal and Veltkamp (2013) did find a correlation between transportation and empathy. However, transportation did not just play a positive moderating role as predicted. While reports of high transportation correlated with better scores on empathy, reports of low transportation actually reduced empathy outcomes in the fiction condition. Perhaps more interesting was the finding that readers in the nonfiction condition showed opposite results. When readers in the nonfiction condition experienced higher transportation their empathy actually

lessened after reading. These findings are particularly important because they highlight the role of transportation as a moderator for empathy, and they show genre matters because transportation levels did not lead to the same positive cognitive outcomes when participants read nonfiction. On top of that, "these results are important, because previous research has claimed that fiction reading has positive effects, while we are amongst the first who also show that fiction reading might have negative effects, when readers do not become transported, and hence, disengage from literature" (Bal & Veltkamp, 2013, p. 8). The findings in this study support the claim that transportation is a key component of the reading experience, while also bringing to light the complexities of transportation and its potential relationship to empathy outcomes.

Research about processing narrative has also often assumed that transportation enables or entails "the ability to infer what is in the minds of others" (Mar et al., 2006, p. 696), or theory of mind. Thus far, the research on this topic has produced conflicting results. Kidd and Castano (2013), for instance, found no correlation between transportation and outcomes on theory of mind in any of their three conditions – literary fiction, popular fiction and nonfiction. In addition, transportation was not significantly different across those conditions, in direct contrast to the Bal and Veltkamp (2013) findings about transportation variance in fiction and nonfiction conditions.

While transportation and Theory of Mind [ToM] may not be correlated, mind-reading is still considered a core component of narrative simulation. In addition to the theoretical convictions and evidence provided by Zunshine (2006), Mar (2011) was able to show there is "substantial overlap between areas of the brain concerned with theory-of-mind and areas concerned with understanding stories" (Djikic et al., 2013, p. 32) with an

extensive meta-analysis of functional Magnetic Resonance Imaging studies on narrative processing.

In a study conducted by Kidd and Castano (2013), "Reading Literary Fiction Improves Theory of Mind," the authors tested the hypothesis that reading literary fiction would promote theory of mind compared to both nonfiction and popular fiction because literary fiction especially encourages perspective taking. The results showed temporary boosts in theory of mind for readers in the literary fiction condition only. The authors interpreted these results as evidence that literary fiction—above popular fiction and nonfiction—increases readers' mind-reading skills because the "features [of literary fiction] mimic those of ToM" (p. 378), and "by prompting readers to take an active writerly role [i.e., seek meaning in the gaps] to form representations of characters' subjective states, literary fiction recruits ToM" (p. 380). Their interpretation of the data more than coincidentally mirrors the claims about the connections between fictional and actual minds that were strongly supported by Zunshine (2006) as well.

While these studies provide support for the concept of narrative simulation, and provide intriguing information about that simulation, they also point to complexities. Yes, transportation is involved in simulation and so is perspective taking, but not always.

Prosocial Outcomes—Empathy

Perhaps the most enticing aspect of narrative simulation is what readers may take away from the experience. In one of the first studies to investigate the potential benefits of reading fiction versus nonfiction, Mar et al. (2006) state, "The close relation between navigating social- and story-worlds has a number of implications, not the least interesting of which is the proposal that readers of predominantly narrative fiction may actually

improve or maintain their social-inference abilities through reading" (p. 698). In the 2006 study, "Bookworms versus nerds: Exposure to fiction versus nonfiction, divergent associations with social ability, and the simulation of fictional social words," Mar et al. asked whether or not exposure to literature or nonfiction influences an individual's social ability, which the authors consider to be a combination of empathy and Theory of Mind. Participants in the study completed the Author Recognition Test to provide a measurement of their print exposure and then completed a series of tasks that measured empathy and Theory of Mind.

As hypothesized, Mar et al. (2006) found a positive correlation between exposure to fiction and performance on the social ability tasks, while participants with more exposure to nonfiction generally had a negative correlation to performance on empathy and Theory of Mind. "While a causal direction has yet to be established for the observed relations, the possibility that social skills may be improved as a result of exposure to social narratives remains a compelling one" Mar et al. conclude (p. 708). Though, as the authors caution, correlation is not the same as causation, identifying a long-term connection between readers of fiction versus nonfiction and their prosocial cognition helped expose a tangible link between fiction and empathy.[13]

In a follow-up study, "Exploring the link between reading fiction and empathy: ruling out individual differences and examining outcomes," Raymond A. Mar, Keith

[13] In concurrent efforts to empirical explorations of fiction and empathy, narrative theory scholars such as Martha Nussbaum (1990) and Suzanne Keen (2006, 2007) contributed to the theoretical foundation of what they termed narrative empathy. Of note, the literary conception of narrative empathy essentially encapsulates the same mechanisms as psychological theories of narrative simulation. As Keen writes in the entry for narrative empathy in *the living handbook of narratology*, "Narrative empathy is the sharing of feeling and perspective-taking induced by reading, viewing, hearing, or imagining narratives of another's situation and condition. Narrative empathy plays a role in […] in mental simulation during reading, in the aesthetics of reception when readers experience it, and in the narrative poetics of texts when formal strategies invite it."

Oatley and Jordan B. Peterson (2009) fine-tuned the conclusion of the 2006 study by ruling out the explanation that individual differences explained the positive correlation between fiction and prosocial cognition, and the negative correlation between nonfiction and prosocial cognition. By having participants complete the Author Recognition Test and a personality test, Mar et al. (2009) could account for individual differences when analyzing participants' performance on prosocial cognition measures; the data showed "that it is not merely the case that individuals who are more open to experience tend to enjoy fiction more and also perform better on tests of empathy" (p. 421). Mar et al. (2009) replicated the 2006 findings that exposure to fiction predicts performance on empathy, and extended those findings by looking more closely at the role of participants' tendency to get transported into a story. An individual's tendency to become transported also positively correlated to empathy outcomes. In discussing these findings, Mar et al. (2009) write:

> It seems that a ready capacity to project oneself into a story may assist in projecting oneself into another's mind in order to infer their mental states. It has recently been observed that a very similar pattern of brain activity underlies such diverse cognitive processes as autobiographical memory, future-thinking, spatial navigation and mental inferencing, and that this network may represent self-projections (Buckner and Carroll, 2007; Spreng, Mar and Kim, 2009). (p. 421)

This set of studies contributes to growing evidence of a relationship between fiction and empathy. In addition, it seems to indicate that transportation continues to play a role of some kind. Furthermore, the studies support the claim that narratives, both fiction and nonfiction, differentially impact readers cognitively – not only when they are in the midst of processing the narratives, but also after the actual reading experience occurs.

Building from Mar and Oatley's (2008) theory on simulation, Dan R. Johnson

(2013) explored the potential of exposure to fiction stories featuring out-group protagonists to reduce prejudices against that out-group. Out-group is any social group given an "other" status by virtue of being different from the in-group, and due to that difference, members of the in-group do not identify with members of the out-group, which may lead to a variety of issues, including prejudice. Johnson hypothesizes that literary fiction "offers a vehicle for prejudice reduction that combines multiple successful interventions, including perspective-taking, indirect contact, counter-stereotypical imagery and culture exposure" (p. 78). Johnson ran two experiments, which assessed participants' changes in affective empathy—feeling for the character, as in compassion or sympathy—and prejudice toward Arab-Muslims, as well as the role of transportation in moderating those outcomes.

Participants read an excerpt from *Saffron Dreams* (2009), written by Shaila Abdullah, in which the protagonist—an educated and strong-willed Muslim woman, who also happens to be pregnant—stands up to attackers that verbally and physically assault her in a subway station (Johnson, 2013). The passage contains "significant inner monologue that accentuates the protagonist's strength of character while also providing exposure to Muslim culture (p. 81). Before reading, Johnson obtained a baseline measure of participants' prejudice using the Anti-Arab-Muslim Attitudes scale, which included statements for participants to rate agreement with, such as, "Islam is an archaic religion, unable to adapt to the present" and "Most Arab countries are fanatic, nationalist, and in conflict with human rights." After reading the passage, participants rated how much empathy they felt toward Arab-Muslims and completed Green and Brock's (2000) transportation scale; prejudice was assessed by asking participants to rate Arab-Muslims

as a group on stereotypical traits. In addition, Johnson asked participants explicitly, "To what degree do you believe the reading improved your attitudes toward Arab-Muslims?" (p. 81).

The results of the study confirmed Johnson's hypothesis. Participants who were more transported into the story rated Arab-Muslims significantly lower in stereotypical negative traits and expressed significantly lower negative attitudes toward Arab-Muslims as well, after reading the passage. In addition, affective empathy and motivation to reduce prejudice were also significantly increased post-reading. Effects held after controlling for baseline prejudice and demand characteristics.[14] Johnson interpreted these results as support for Mar and Oatley's (2008) simulation theory because "readers of literary fiction who were more transported into the story exhibited empathic growth and prejudice reduction" indicating that "high levels of emotional reaction, mental imagery, and full attentional engagement appear requisite for empathic growth and prejudice reduction" (p. 87). The results of Johnson's studies highlight the potential benefits of reading fiction, which is particularly exciting because he tackles a real-world issue. As he writes, "the current studies have practical implications for the use of narrative fiction in educational and work settings" (p. 88). Johnson's study also aligns with results in the narrative persuasion literature, since transportation has also been linked to persuasion but importantly, only in the case of fiction (Green & Brock, 2000; Busselle and Bilandzic, 2009). These studies showed "that individuals who were more transported into a story exhibited more story-consistent beliefs post reading," which means that literary fiction

[14] Demand characteristics refers to cues that alter the way participants behave in an experiment, or complete tasks in an experiment, because they have become aware of the experiment's purpose and therefore change their answers to align with that interpretation. By controlling for this, the experimenters ensured that participant responses were in fact authentic and not compromised.

possess the potential to achieve desired learning outcomes or, even desired changes in personality (Djikic et al., 2009).

Unfortunately, experimental support for the claim that fiction enables, or enhances, empathy among readers is not consistent. Maja Djikic, Keith Oatley and Mihnea C. Moldoveanu (2013) investigated the potential of literature to increase empathy by having participants read either an essay or short story. Prior to reading, participants completed the Author Recognition Test, personality and empathy measures; after reading, participants were again tested for empathy[15]. The results were mixed. For empathy, there were significant changes in what the authors termed "Cognitive Empathy"—a measurement corresponding to the Perspective Taking subscale in the Interpersonally Reactivity Index (IRI, Davis, 1983) and the Mind in the Eyes Test, which is a non-self-report measure of Theory of Mind ability. For participants in the fiction condition, the results showed they did have higher scores on both of these measures after reading, but "it is important to note that the significant effect (for both Change of Cognitive Empathy and Mind in the Eyes Test) was driven by the covariates, and that the overall effect of Condition (short stories vs. essays) was not significant" (p. 40). The significant covariates driving the effect included a participant's openness, as measured on the Big Five personality trait questionnaire, and reported interest in the text.

Interestingly, participants identified with low-Openness experienced a positive change, an improvement on their cognitive empathy in the fiction condition, whereas

[15] Before reading, personality was measured using the Big-Five Inventory (John, Donahue, & Kentle, 1991). Empathy was measured with two subscales taken from the Interpersonally Reactivity Index (IRI)—Empathic Concern and Perspective Taking (Davis, 1983). The IRI has been validated as general measure of empathy and is frequently used in this line of research. Post-reading measures included the two IRI scales again and the Minds in the Eyes Test (Baron-Cohen et al., 2001)—a measurement more commonly considered to measure perspective taking ability.

participants with high openness seemed to exhibit a ceiling effect with their cognitive empathy scores (i.e., they started out with higher empathy scores to begin with, leaving little room to go up after reading the story). This finding suggests that improvements to empathy after reading a fiction story do not occur as a standard outcome, but a potential one nonetheless, especially for those who may require it most (i.e., readers measuring low in openness). In contrast, participants in the nonfiction condition did not show significant improvements in cognitive empathy at all, even with covariates factored in. In addition, the effect for change in "Affective Empathy"—a measurement corresponding to the Empathic Concern subscale of the IRI—was not significant for either the fiction or nonfiction condition.

These results suggest "a role of fictional literature in facilitating development of empathy" (p. 29), but are surprising because there was not a main overall effect of condition, fiction versus nonfiction. The improvements to empathy that were found stemmed from individual differences in readers and those improvements were limited to "cognitive empathy" rather than "affective empathy." An argument can also be made that what the authors called "cognitive empathy" is actually measuring Theory of Mind.[16] However, readers with the necessary individual traits to experience improvements on empathy, significantly improved only after reading fiction, so there is also evidence of a causal effect of reading fictional literature on empathy. Djikic et al. (2013) conclude:

> Since humans are not born with cognitive empathy but develop it in middle childhood, it seems reasonable that there could be a potential of continuing to develop it throughout one's lifetime, and that fictional literature could be one means of doing this. While we have obtained some evidence for this relationship, in order to answer questions about the quality, speed, and mechanism of this development, it is necessary to conduct further

[16] This point will be addressed in the next chapter, which discusses the limitations of existing empirical work and how the experiments conducted in this thesis try to address them.

experiments. (p. 44)

Though the results of this study are complex, and not nearly as clean as necessary to justify the claim that reading fiction has positive potential to improve readers' empathy, the study still shows that fiction does influence (certain) readers differently than nonfiction does.

Though the authors expressed concern that their results may have been muted because texts in the fiction and nonfiction conditions were comparable in their "literariness," it can also be seen as a strength of their study. The authors took particular care to level out the materials in both conditions, so that length, reading difficulty, artistic merit (literariness) and engagement, were comparable. Participants in each condition read one of eight potential options, in both the fiction and nonfiction condition. The use of multiple stories in each condition discourages skeptical interpretations that the results are a one-off response specific only to a single story, and bolsters the claim that literary fiction generally does have the capacity to improve a reader's empathy.

That said, if both fiction and nonfiction texts can be considered literary, then the next question becomes: What exactly about reading fiction makes it special, such that it can increase empathy, if not its literariness? What matters more – the "literariness" of the text, or the genre expectation of the reader when they engage with the text? In the next chapter, I consider the limitations of the studies presented here to inform the development of my own experimental design in an effort to increase clarity about how narrative simulation works, and when and why it works the way it does.

CHAPTER 3: ADRESSING LIMITATIONS IN CURRENT RESEARCH

The research conducted so far should be considered exploratory and far from definitive. Certainly, as the previous chapter demonstrates, there is growing evidence that reading narratives, and in particular, reading fiction, influences readers in intriguing, and potentially beneficial, ways. Existing studies provide a critical step in pushing the empirical study of narrative, and especially that of literature, forward. Their cumulative evidence provides support for longstanding theoretical arguments about narrative simulation, as well as hunches held regarding the unique qualities of fiction.

However, broadly demonstrating that a theorized process occurs does not equate to an explanation of how it occurs. As Raymond A. Mar, Keith Oatley and Jordan B. Peterson (2009) write in "Exploring the link between reading fiction and empathy: Ruling out individual difference and examining outcomes," "[…] evidence is accumulating that the reading of narrative fiction can have important consequences, whose quality and underlying mechanisms require closer study" (p. 424). As Mar et al. suggest, a single study cannot uncover all the facets involved in reading fiction or nonfiction; rather, collectively we should strive to fill the gaps in the research by acknowledging limitations in studies as they are conducted, and the subsequent restrictions of the conclusions put forward. In doing so, we open the doors to not only ask more questions, but better and more nuanced questions, which lead to clarity and increased understanding. So far, the empirical study of narrative confronts limitations in two key areas: 1) variance in stimuli, and 2) conflation of constructs—transportation, empathy and perspective taking.

Considering Stimuli: Don't The Stories Participants Read Matter?

Is it really fair to draw comparisons between how readers process a fictional short story, or chapter from a work of fiction, and how readers process a brief news article, or multiple news articles? On one hand, it may represent a realistic difference in the texts readers are exposed to on a daily basis. On the other, drawing comparisons about cognitive processing and outcomes between fiction and nonfiction while using texts that vary so greatly, not only in content, but also in style and reading experience, raises concerns that the comparison these studies have drawn between fiction and nonfiction is not as clean, or as meaningful, as it could be.

In terms of style, news stories have a distinct structure, which may trigger readers to process the information in a specific way. Considering the findings of Zwaan (1994) and Bruner's contributions, it is conceivable that the visible structure of news stories alone causes readers to engage with the text from the logico-scientific mode rather than the narrative mode, regardless of content. Second, a reading experience that entails a single exposure to a contained story does not mirror the reading experience of reading multiple and shorter articles; even if the articles cover the same topic generally, each is a separate story.

The strength of the Bal and Veltkamp (2013) study was that their results held over a week delay, which suggests that engagement with fiction or nonfiction does have lasting effects on readers. Their study also provided support for the idea that transportation levels enable empathy of the reader both positively and negatively. But the materials used in the fiction and nonfiction conditions should be considered severe limitations of their study. In the nonfiction condition, participants read multiple short

news stories, which reduced the likelihood of transportation due to task switching. Immersion in a storyworld is much less likely to occur without sufficient time or material with which to do so. Additionally, the fiction material used was a chapter out of a Sherlock Holmes story. This presents three potential problems: (1) the fiction material didn't present a closed narrative, which may change how readers interact with the text; (2) because Sherlock Holmes is such a well-known literary figure, it's possible the participants engaged at different levels purely out of prior of knowledge of the Sherlock Holmes storyworld;[17] and (3) the mystery genre may not invoke as much emotional engagement because the focus of mystery novels is to gather information and solve the mystery, which could make the text susceptible to the logico-scientific mode rather than the narrative mode.

The conclusions of Zwaan's (1994) study, which brought to light the role of genre expectations in discourse processing, are similarly hampered by the materials used. A key strength of the study was that readers in both conditions, news story and literary story perspectives, read the same texts. However, the texts Zwaan used are not necessarily representative of natural texts we typically encounter. In the study, Zwaan chose stories that covered "interactions between civilians and authorities (e.g., the police)" but used excerpts averaging just 216 words in length. Though the excerpts came from both novels and news articles about roughly the same topic, a reader's engagement with such a brief amount of text is not representative of nonfiction texts readers encounter in day-to-day

[17] In the case of Sherlock Holmes, readers' familiarity with the character and that fictional storyworld are even further complicated by the presence of Sherlock stories in other media, especially the popular TV series (2010-current). This complexity brings up another interesting question for future research, however. How does increased familiarity with fictional characters and their storyworlds in other media platforms influence individuals processing written narrative? Does it enhance or hinder factors like transportation, identification and empathy?

life,[18] and certainly not representative of fiction reading experiences. In addition to the brevity of the text excerpts, another concern is that Zwaan had participants in the literary expectation and news expectation conditions read *seven* of these brief passages. Again, along the same lines as the criticism of the Bal and Veltkamp (2013) nonfiction condition (read multiple new stories vs. one fiction chapter), reading multiple short excerpts in this study could have led to results stemming from task repetition under a certain instruction rather than actually capturing a genuine genre effect. In other words, the genre effect may have been experimentally magnified by repeated exposure to multiple brief texts, which had been prefaced with specific reading instructions.[19] Yet, despite these considerations, the fact that Zwaan still identified an interaction between genre expectation and discourse processing outcomes with such brief materials may speak to the potential potency of genre expectations on all text processing.

Though limitations in these studies exist, it is important to also recognize that the empirical study of literature is in the early stages of development. In these early stages, a central part of the discovery focuses on experimental design. A single experiment cannot answer a research question completely, but collectively the research seeks to fill in the gaps by addressing limitations, such as those discussed above, in future studies. We

[18] From 10 years of experience in journalism, as a writer and an editor, an article less than 400-500 words is the exception, and far from the rule. An article less than 300 words is typically considered a brief, or a snapshot of information, for instance. Of course, this point could be debated within the context of social media now, but in terms of traditional media (even when online), and even more so in terms of a reader's interaction with fiction content, an analysis of texts that average 216 words (less than half a page of double-spaced text) raises questions regarding the generalizability of the findings.

[19] Participants in the news reading condition received instructions stating: "The following texts are all excerpts from news stories that appeared in either *NRC-Handelsblad* or *de Volksrant* [two quality Dutch journals]. These stories describe important events that happened during the 1980s. Please read these stories just like you would normally read a news story." Participants in the literary reading condition received instructions stating: "The following texts are all excerpts from novels by famous Dutch and other European literary authors. Please read these texts just like you would normally read a novel." (Zwaan, 1994, p. 924)

should add that not all empirical studies on reading fiction are susceptible to the critique launched above.

For instance, Kidd and Castano (2013) put significantly more consideration into the materials they selected in both the fiction and nonfiction conditions. In their first experiment, the authors selected literary fiction short stories, ranging from Anton Chekhov's 1884 *Chameleon* to Don DeLillo's *The Runner*, first published in Harper's Magazine in 1988. Participants in the nonfiction condition read articles from the Smithsonian that focused on a nonhuman subject, including "How the Potato Changed the World" and "The Story of the Most Common Bird in the World." In their second experiment, the authors used roughly the first 10 pages of recently published novels, specifically three recent finalists for the National Book Award for fiction. Participants in the popular fiction condition read excerpts from bestsellers identified on Amazon that are fiction but not literary fiction.[20]

Though the line between literary fiction and popular fiction can be critiqued as being arbitrary, or unclear, the primary difference to consider between the two in this context pertains to the representation of consciousness in the works of fiction. Literary fiction is far more likely to portray multiple, and metarepresentations, of character, author, and narrator, consciousness; it is those portrayals of consciousness, the qualia, that potentially enables readers to become co-experiencers during the reading experience. Popular fiction, in contrast, is less prone to interior monologue and metarepresentation,

[20] The excerpts from the National Book Award finalists came from *The Round House* by Louise Erdrich, *The Tiger's Wife* by Tea Obreht, and *Salvage the Bones* by Jesmyn Ward. The popular fiction excerpts came from *Gone Girl* by Gillian Flynn, *The Sins of the Mother* by Danielle Steel, and *Cross Roads* by W. Paul Young.

and its content can primarily be broken down into action following action, with interspersed dialogue.

The authors made deliberate choices about the material in each experiment and each condition to help them specifically assess the potential of *literary* fiction to improve a reader's perspective taking abilities. In this study, they conducted three additional experiments with new literary short stories and popular fiction short stories each time. The difference in writing style, publishing dates, and genre, in both conditions, strengthens the findings of their study considerably. Only participants who read literary fiction showed enhanced Theory of Mind after reading, compared to participants who read popular nonfiction in five of the six experiments and participants who read nonfiction in the first experiment. In the context of this thesis, the only critique that can be applied to the materials in this study is that the authors did not carry the nonfiction condition through all the experiments, or include a nonfiction condition with materials that featured human subjects rather than potatoes or plants, though to be fair, the authors wanted to focus on literary fiction versus popular fiction. However, that factor limits the comparison between literary fiction and nonfiction.

Similarly, the findings of the Johnson (2013) study are also limited because he did not incorporate a comparison group. Participants who read fiction featuring a female Muslim protagonist under duress showed a reduction in bias toward Arab-Muslims, but a comparison group in which participants read a nonfiction text about Arab-Muslims encountering similar acts of aggression and bias toward them in the real world would have extended the study in interesting ways, while also likely augmenting the interpretation of the results obtained in the fiction group.

It is imperative for empirical studies of narrative to consider the material used more thoroughly and thoughtfully, particularly when comparing fiction and nonfiction reading experiences. In consideration of the way previous studies have drawn comparisons between varied fiction and nonfiction texts, it was decided for the experiments conducted in this thesis that the nonfiction material would be as comparable to the fiction material as possible. Accordingly, the nonfiction story used in the experiment is a single enclosed narrative that is comparable in length, ease of reading, and engagement. By not using newspaper articles or short expository pieces from the Smithsonian, but a narrative that is still clearly nonfiction, this experiment aims to isolate the genre effect more clearly than previous studies.

Conflating Constructs & Measuring Them

Another difficulty with existing research stems from the variance in definitions of the construct the studies aim to measure—transportation, perspective taking, and empathy. When researchers conflate constructs, or conceptualize or define them differently, it becomes difficult to synthesize the data about the topic of concern, such as narrative empathy, in a meaningful way. As the field moves forward, and more experiments are conducted, researchers will need to move away from general, and murkier, descriptions of constructs, toward clear and exacting operational definitions. The experiments conducted for this thesis project were designed with a heightened awareness of this issue and aim to add clarity to the field's conceptualization of these constructs—transportation, perspective taking, and empathy—in the context of narrative simulation specifically.

Getting a grasp on transportation

Ever since Gerrig (1993) hypothesized that the same cognitive mechanisms are behind how we process narratives *and* how we process the day-to-day real world, and that readers could be "transported" into fictional worlds in a way that led them to emotionally engage and react mentally to that world, the concept of transportation has been linked to almost all potential outcomes of reading fiction (Mar et al., 2006). As noted earlier in the proposal, transportation has been linked to persuasion but importantly, only in the case of fiction. The literature so far indicates "the persuasive effect of fiction is only likely to be realized if fiction is read as fiction, that is if it is not processed in the same way as a factual story or textbook. The persuasive power of fiction is tied to transportation, which presupposes that fiction is read as an end in itself, for pleasure, in a state of immersion, with the reader being entranced by the fictional world" (Nunning, 2015, p. 44).

Research about processing narrative has often assumed that transportation enables or entails "the ability to infer what is in the minds of others" (Mar et al., 2006, p. 696), or theory of mind. Thus far, the research on this topic has produced conflicting results. Djikic et al. (2013) did not measure transportation, a shortcoming the authors recognize in the discussion of their results (p. 42). Kidd and Castano (2013), for instance, found no correlation between transportation and outcomes on theory of mind in any of their three conditions – literary fiction, popular fiction and nonfiction. Bal and Veltkamp (2013), however, did find a correlation between transportation and self-reports of empathy in both fiction and nonfiction conditions. Interestingly, reports of high transportation

correlated with better scores on empathy and reports of low transportation actually reduced empathy outcomes across all material conditions.

Johnson (2013) also measured transportation, using the same scale (Green & Brock, 2000). He writes:

> To integrate with Mar and Oatley's (2008) [simulation] theory, the current study will test the idea that individuals who are more transported in the story likely simulate the characters' thoughts and feelings (i.e., engage in perspective-taking) to a greater a degree and consequently their attitudes should be subject to greater influence while reading and identified a significant interaction between transportation level and reduced prejudiced post-reading. (p. 79)

Johnson did identify a significant interaction between the degree of transportation and reduced prejudice and higher empathy post-reading, but that is not the whole story.

Johnson assumes transportation inherently entails that readers "simulate the characters' thoughts and feelings (i.e., engage in perspective-taking);" Johnson, however, did not measure perspective taking. Therefore, the deduction cannot be made that the transportation levels correlate with empathy outcomes *because* transportation enables or entails perspective taking. Furthermore, Johnson found that "affective empathy and intrinsic motivation independently and significantly mediated transportation's association with reductions in negative Arab-Muslim attitudes. After including [these measures] in the model, transportation was no longer significantly associated with Arab-Muslim attitudes" (p. 85). In other words, it's not clear that a reader's level of transportation led to reduced bias and increased empathy, or whether affective empathy or intrinsic motivation did.

The concept of immersion in a story makes transportation seem like a mechanism that would naturally and inherently be linked to theory of mind and empathy effects. However, the proposed study does not accept that assumption. In addition to conflicting

findings about how transportation correlates to the outcomes of interest, it is feasible that the concept of transportation as Gerrig originally posited it has been imbued with other faculties it never claimed to possess, like perspective taking. Transportation in its essence is a matter of attention, "the extent to which readers forget about their immediate environment and enter the fictional world" (Nunning, 2015, p. 44). Therefore, it is conceivable that transportation may be more important in terms of the richness of the mental representation formed, but perhaps less so in terms of perspective taking or subsequent empathy. Just because readers feel transported into a storyworld, in the sense that they become more aware of the storyworld setting than that of the world around them, does not mean that they automatically take on the perspective of a character. A transported reader may simply visit and watch. By treating transportation as a distinct construct from perspective taking, the proposed study aims to dissect the role, and meaning, of transportation in more detail than existing studies.

A closer look at Theory of Mind and empathy

Existing theory and limited evidence suggest that reading fiction entails theory of mind activities because fiction enables us, perhaps even compels us, to take on the perspectives of others (Zunshine, 2006). This act of perspective taking might even have the potential to increase our ability to empathize with others. As Nunning (2015) writes, perspective taking may be at the root of the potential of fiction to improve readers' cognitive abilities: the necessity to follow and share characters' thoughts and feelings, and to practice the combination of empathy and 'theory of mind' in a situation which provides ideal conditions for learning" (p. 48; Nunning, 2014). However, the relationship between Theory of Mind, or perspective taking, and empathy remains unclear. How does

perspective taking moderate changes in empathy post-reading, *if* it in fact does? As noted earlier, the relationship between perspective taking and transportation also remains unclear (Kidd & Castano, 2013). Rather than assuming causality exists between these three constructs in some manner, the following experiments considers all three constructs in isolation.

Like Kidd and Castano (2013), the following study also posits "fiction affects ToM processes because it forces us to engage in mind-reading and character construction" (p. 377). However, the scope of the proposed study will not focus on a comparison based on qualitative judgments of the text (i.e., literary fiction vs. popular fiction), but specifically on the influence of genre expectation that is induced by activating either the narrative mode or logico-scientific mode. This approach also has support from Djikic et al. (2013), who "did not find that the type of writing (literary fiction vs. literary nonfiction) made a significant difference for our outcome measures" (p. 41).

While the results from Kidd and Castano (2013) present intriguing implications for future research, their study, along with other studies investigating these constructs, cannot answer whether or not the approach readers take going into the text matters above and beyond what the text itself does. The authors also acknowledged the results as preliminary, but it's worthwhile to note they also ruled out variables, like enjoyment of the text, perceptions of how literary the text was, or exposure to fiction, as relevant to the outcomes. This strongly suggests that engagement with narrative involves processes that extend beyond individual differences.

However, a replication attempt (Panero et al., 2016) of Kidd and Castano by three independent research groups, with 792 participants randomly assigned to 1 of 4 conditions (literary fiction, popular fiction, nonfiction and no reading), found no significant changes in Theory of Mind performance for participants in the literary condition; and contrary to Mar et al. (2009), Panero et al. (2016) also found that individual differences do matter, since scores on the Author Recognition Test predicted performance on the Theory of Mind task in all four conditions (p. 46). The work conducted by Panero et al. (2016), combined with ambiguity around operational definitions across various studies—does empathy entail perspective taking, or are they different mechanisms?—appropriately raises caution about drawing conclusions that link reading fiction to improvements on social cognition. The results about how reading fiction varies from reading nonfiction are simply mixed at this point, and thus require further and more rigorous investigation.

The proposed study will isolate the genre effect specifically and explore if the genre and related features of the text induce theory of mind independently, or if the framework readers apply to the text dictates subsequent theory of mind activities regardless of the actual material presented. Following the impetus of this chapter, the next chapter identifies the operational definitions of transportation, perspective taking (Theory of Mind) and empathy, and details a description of the experimental design, including procedures and measurements.

CHAPTER 4: METHODOLOGY AND HYPOTHESES

The goal of the following experiments is to explore the effect of genre expectation on the degrees of transportation and empathy experienced by readers in each condition. These dependent variables will be measured pre- and post-test through a series of questionnaires, with the goal of identifying potential relationships between text genre, genre expectation and cognitive outcomes. How do genre expectation and text genre influence a reader's transportation, or changes in empathy? Secondly, does the degree of transportation correlate with increased empathy? If reading activates or exercises an individual's Theory of Mind, then it follows that reading stories may promote perspective taking and thus, empathy. But which stories and under what conditions?

Operational Definitions

Transportation into the narrative captures a reader's immersion into a storyworld. Theory of Mind, as previously discussed, is the ability to identify others' mental states, and in doing so, better understand their emotions and behavior. In other words, it is a mind-reading ability (Zunshine, 2006) that hypothetically facilitates, or accompanies, perspective taking. Empathy is defined here as the capacity to share the feelings and emotions of another. Empathy is distinguished from sympathy, which correlates with

feeling "for another" rather than "with another"[21]. However, as discussed in the previous chapter empathy is typically treated as encompassing perspective taking and sometimes sympathy as well; the measurement of empathy used in the following experiments therefore treats empathy as a multidimensional concept.

Measurements

1) Author Recognition Test-Revised (ART) (Mar et al., 2006). The ART has been validated extensively as a way to *assess participants' exposure to fiction, and book reading habits*, while avoiding the problem of participants wanting to appear 'better read.' Participants have to check off author names they recognize, but are discouraged from lying since there are fake author names on the list. The Mar et al. (2006) revision of the ART was used because the researchers updated the ART to include an equal amount of fiction and nonfiction authors. Therefore, we can potentially see a difference between participants' experience based on a predilection for fiction or nonfiction. (See Appendix A for all ART items)

[21] Empathy is a very complex concept, which continues to have entangled meanings. For an authoritative look at empathy in the context of narrative studies, see Suzanne Keen's *Empathy and the Novel* (2007). Currently, in cognitive psychology especially, empathy is increasingly conceived of as a multidimensional concept. Though empathy has often been generalized as a sensation that simultaneously entails *both* sharing feelings and perspective taking, in recent years it has become more common to delineate empathy into cognitive and affective components. The cognitive component correlates to perspective taking, "the ability to understand the world from another person's point of view and to infer beliefs and intentions" and affective empathy "refers to the capacity to share another's feelings and emotions" (Stansfield & Bunce, 2014, p. 9). However, the combined conception of empathy continues its presence in narratology, which defines narrative empathy in *the living handbook of narratology* as "the sharing of feeling and perspective-taking induced by reading, viewing, hearing, or imaging narratives of another's situation and condition" (Keen, Narrative Empathy, para. 1). Whether or not perspective taking is better conceived as a component of empathy, or Theory of Mind, remains up for debate, which is further complicated by mixed uses of these constructs and their definitions in current research (Bal and Veltkamp, 2013; Kidd and Castano, 2013; Johnson, 2012; Dvash & Shamay-Tsoory, 2014). The discussion of the experimental results aims to contribute, if only a little, to advancing this conversation toward a resolution.

2) Interpersonal Reactivity Index (IRI) (Davis, 1983). The IRI will provide an overall measure of *empathy*. Changes in the participants answers on the IRI from pre- to post-reading will be analyzed for the measurement overall, as well as for the individual subscales. In addition to the perspective taking subscale, the IRI includes the subscales personal distress, empathic concern and fantasy. However, the subscales were not validated using a factor analysis and as a result, a single score was used in the analysis.
    a. Personal distress measures feelings that impede on helping others.
        i. Example item: Being in a tense emotional situation scares me.
    b. Empathic concern measures sympathy.
        i. Example item: I often have tender, concerned feelings for people less fortunate than me.
    c. Fantasy measures the tendency to get transported into the story.
        i. Example item: When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.
    d. Perspective taking measures the tendency to take others points of view.
        i. Example item: I sometimes try to understand my friend better by imagining how things look from their perspective. (See Appendix A for the complete scale)

3) Transportation Scale (Green & Bock, 2000). This scale assesses immersion into a story, or the phenomenological experience of being absorbed in a story (Green & Brock, 2000).
    a. This scale was used in its entirety (all 12-items) in Experiment 1. In Experiment 2, the Transportation Scale-Short Form was used, which consisted of 6 items. These 6 items were identified following a factorial validity analysis of the original 12-item scale (Appel et al., 2015). Following the development of the 6-item scale, Appel et al. write, "Theoretically, these analyses provide empirical support for the conceptual definition of transportation as an *integrative melding* of affect, cognition and imagery" (p. 259-260). (See Appendix A for complete scales)
4) Narrative Engagement (Busselle & Bilandzic, 2009). This narrative engagement scale was developed "based on a mental models approach to narrative processing" and "distinguishes among four dimensions of experiential engagement in narratives: narrative understanding, attentional focus, emotional engagement, *and* narrative presence" (p. 321). This scale was brought into the Experiment 2 to provide a comparison measure to the Green and Brock (2000) Transportation Scale.
    a. Narrative understanding measures ease in comprehending a narrative.
    b. Attentional focus describes a reader's focus or distraction from the narrative.
    c. Emotional engagement refers to feeling for and with characters.

d. Narrative presence, differentiated from attentional focus, is the sensation that one has left the actual world and entered the story. According to Busselle and Bilandzic (2009), narrative presence entails both a "loss of awareness of self and surroundings" and a "sensation of entering another space and time, which should be unique to narratives…as a result of mentally constructing an alternate world" (p. 341).

e. The items in the scale, as well as their dimension-correlations, can be found in the appendices. (See Appendix A for complete scale)

5) Sentence Verification Task (SVT; Royer et al., 1979). The SVT is a 16-item comprehension task that served both as a comprehension measure and a check to make sure participants read the story. Participants were presented with 16 sentences, 8 of which were either taken directly from the text or paraphrased sentences in the text, and 8 of which were not in the text at all. Participants had to identify which of the sentences were "old", from the text, or "new", not from the text.

6) Manipulation Check. At the end of the survey every participant was asked: Do you believe the story you read was fiction/nonfiction? This question modified to align with the genre instructions the participant received. Therefore, a participant who was told they were reading fiction, but read nonfiction, would answer Yes/No to "Do you believe the story you read was fiction?" In addition to supplying a Yes/No answer to this question, participants were also asked to explain their answer.

Materials

Prior to conducting the following experiments, a fiction and nonfiction short story were edited to comparable lengths and reading difficulty. The fiction story was developed from *My Oedipus Complex*, written by Frank O'Connor, and was edited down to 2,934 words. The nonfiction story was developed from *Phineas Gage: A Gruesome But True Story About Brain Science*, written by John Fleishman, and was edited down to 2,561 words. The texts measured a 5.1 and 5.3, respectively on the Flesch-Kincaid Level Readability Formula. The texts were normed by 40 participants, who read both texts in counter-balanced order and rated engagement and difficulty, and identified the text genre as nonfiction or fiction on a 10-point Likert scale ranging from "Absolutely Nonfiction" to "Absolutely Fiction". The norming established that the texts did not differ in engagement or reading difficulty, and that they were clearly recognized as fiction and nonfiction, respectively.

The shortened versions of each story were used for Experiment 1. In Experiment 2, the text length of both stories was extended. In the case of the fiction story, this meant including the entire short story without edits, totaling 4,521 words. For the nonfiction story, edits were still applied to maintain the narrative nonfiction content and voice, since the goal was to present readers with text as narratively comparable as possible despite the differences in genre and content matter. The nonfiction text in Experiment 2 totaled 4,047 words. (See Appendix B for complete texts of stories in both experiments)

Procedure

Experiment 1

Participants were recruited using Amazon Mechanical Turk. Participants received $1.25 for completing the study (N = 68). Six participants, who spent too little time in the survey for their responses to be valid and representative of completing the tasks as directed, were dropped from the analysis resulting in final total of 62 participants. The average age of participants in this group was 39, with a minimum of 21 and a maximum of 68. Of the 62 participants, 30 identified as male and 32 as female.

Participants were randomly assigned to one of four conditions (genre expectation x text genre).

1. Fiction x Fiction
2. Fiction x Nonfiction
3. Nonfiction x Fiction
4. Nonfiction x Nonfiction

Table 1: Participant x Condition – Experiment 1

	1-F/F	2-NF/NF	3-F/NF	4-NF/F
Male	7	5	13	5
Female	8	13	2	9
Total	15	18	15	14

Prior to receiving instructions that manipulated genre expectations and reading the text, participants completed the Author Recognition Test (ART; Mar et al., 2006), a measurement of print exposure to both fiction and nonfiction. Participants also completed

the Interpersonal Reactivity Index (IRI; Davis, 1983), a multidimensional scale for measuring empathy.

Participants then read the text, fiction or nonfiction story, after which they completed a 16-item Sentence Verification Task (SVT) to evaluate comprehension. Three participants were removed from analysis for having more than 8 incorrect answers on the SVT. After the SVT, participants completed the Transportation Scale (Green & Brock, 2000) and completed the IRI again.

Experiment 2

Participants were recruited using Amazon Mechanical Turk. Participants received $1.25 for completing the study (N = 130). Six participants, who spent too little time in the survey for their responses to be valid and representative of completing the tasks as directed, were dropped from the analysis resulting in final total of 124 participants. The average age of participants in this group was 39, with a minimum of 19 and a maximum of 72. Of the 124 participants, 51 identified as male and 73 as female.

Participants were randomly assigned to one of four conditions (genre expectation x text genre).

1. Fiction x Fiction
2. Nonfiction x Nonfiction
3. Fiction x Nonfiction
4. Nonfiction x Fiction

Table 2: Participant x Condition – Experiment 2

	1-F/F	2-NF/NF	3-F/NF	4-NF/F
Male	9	19	13	10
Female	19	14	20	20
Total	28	33	33	30

Prior to receiving instructions that manipulated genre expectations and reading the text, participants completed the Author Recognition Test (ART; Mar et al., 2006), a measurement of print exposure to both fiction and nonfiction. Participants also completed the Interpersonal Reactivity Index (IRI; Davis, 1983), a multidimensional scale for measuring empathy.

Participants then read the text, fiction or nonfiction story, after which they completed a 16-item Sentence Verification Task (SVT) to evaluate comprehension. Three participants were removed from analysis for having more than 8 incorrect answers on the SVT. After the SVT, participants completed the Transportation Scale (Green and Brock, 2000) and completed the IRI again.

Hypotheses

The primary aim of the proposed study is to investigate if, and how, genre expectations and text genre influence how readers process narrative. The dependent variables measured in this study are empathy, transportation and comprehension. The goal is to identify if, and how, genre expectation and text genre (fiction, nonfiction) influence the dependent variables.

Experiment 1

In congruence with the theoretical background, research on genre expectations (Zwaan, 1994), and the distinction between narrative mode of thought and the logico-scientific mode of thought, the first hypothesis is that genre expectations will influence text processing such that readers with a fiction expectation will show increases in empathy, as captured in the IRI from pre- to post-reading. In contrast, readers with a nonfiction expectation will exhibit decreased IRI scores. It also, however, possible that the genre-defining features and style of each story will override the genre expectation accordingly. If this is the case, empathy outcomes will instead be influenced by text genre, such that participants who read fiction will show increases in empathy and participants who read nonfiction will exhibit decreased IRI scores.

The second hypothesis that will be tested is whether genre expectations or text genre influence the degree of transportation. In line with existing research on transportation, it is expected that readers of the fiction text will report higher transportation than readers of the nonfiction text. It is also possible, however, that the genre expectation will moderate these outcomes.

The third hypothesis that will be tested is if transportation levels are reflected in the empathy outcomes. If this is the case, then the more a reader feels transported, the more likely the reader is to engage with theory of mind practice and experience empathy, and vice versa. This view has received conflicting support in the literature thus far (Bal & Veltkamp, 2013; Johnson, 2013; Kidd & Castano, 2013), and researchers have often assumed going in that transportation enables the perspective taking that leads to changes in empathy. I do not make that assumption, and hypothesize that the proposed study will

show that transportation functions independently, and is not correlated with empathy outcomes.

Finally, in regards to the manipulation check, I anticipate that a majority of the participants will buy into the manipulation. Secondly, even if participants realize, when prompted after reading, that the story they read was not the genre they were told, I predict the genre expectation will still have exerted its influence on the online processing. In other words, the post-hoc realization is precisely that, an offline post-reading realization that arrives too late to affect conscious awareness to counteract the genre expectation framework I established in the task instructions.

Experiment 2

The primary change to Experiment 2 was the length of the stories read in each condition. I hypothesize that the increased reading time will lead to deeper processing, which will intensify the effects on empathy from pre- to post-reading that were found in Experiment 1. The hypotheses of Experiment 2 match those of Experiment 1, but I predict the effects will be enhanced, or become cleaner, due to the increased exposure to the text.

The additional hypothesis in Experiment 2 concerns transportation. The inclusion of the Narrative Engagement scale in the second experiment is intended to help explain the findings concerning transportation in the first experiment. Using both the Transportation Scale and the Narrative Engagement scale enables a comparison of the two scales, which will hypothetically provide additional insight into the theoretical concept of transportation. The aim is to determine the level of correlation between the two scales, and in doing so, better understand what immersion into a storyworld entails.

The outcomes of these experiments and the alignment of the outcomes with these hypotheses is discussed in the following chapter.

CHAPTER 5: RESULTS AND DISCUSSION

In a society saturated with stories, narrative plays the critical role of enabling us to comprehend and navigate the human experience. As a tool for understanding, narrative is fundamental to human cognition and a wealth of theory and growing empirical evidence strongly indicate that reading activates a simulation with critical cognitive and emotional components (Mar, 2008; Tamir, 2016). Importantly, these components have been linked to prosocial outcomes, specifically empathy.

Recent research has provided some support for the claim that reading fiction versus reading nonfiction influences positive changes in readers' empathy (Mar et al., 2009; Djikic et al., 2013; Johnson, 2013). In addition, these outcomes have been linked to the degree of narrative transportation experienced (Gerrig, 1993; Bal & Veltkamp, 2013; Johnson, 2013). Furthermore, there is also evidence that genre expectations moderate text comprehension processes (Zwaan, 1994).

While there is growing experimental support that reading narratives entails a simulated experience that involves transportation, the conditions under which reading leads to improvements in empathy remains understudied. Thus, this study proposed the following research questions: What matters more? "Literary" features of a text, or the genre expectation a reader brings into a text? To answer this question, I examined whether genre expectations and text genre—in combination or independently—influenced participants' empathy, transportation and comprehension.

Results

Experiment 1-Statistical Analysis

A series of 2x2 ANCOVA were conducted with genre expectation and text genre as the independent variables, print exposure in each genre (ART) as the covariates, and comprehension (SVT) and transportation as the dependent variables. The analyses showed that there were no genre expectation or text genre effects on comprehension (*all ps* > .05). There was, however, a significant effect of text genre on transportation $F(1, 52) = 11.28$, $p = .001$, *partial eta squared* = .178, such that participants who read nonfiction reported significantly higher levels of transportation *(M = 63.13, SE = 1.80)* than participants who read fiction *(M = 54.04, SE = 2.00)*.

A 2x2x2 ANCOVA also was conducted with genre expectation, text genre, and time (pre- to post-reading) as the independent variables, print exposure in each genre (ART) as the covariates, and empathy (IRI scale) as the dependent variable. The analysis showed a genre expectation by time interaction, $F(1, 52) = 5.76$, $p = .020$, *partial eta squared* = .10, such that empathy increased from pre- to post-reading for the fiction perspective but decreased for the nonfiction perspective.

Table 3

Means and Standard Deviations on the Measure of Transportation – Experiment 1

Condition	*n*	*M*	*SD*
F/F	13	51.08	2.83
NF/NF	17	62.94	2.5
F/NF	15	63.33	2.73
NF/F	13	57.0	2.87
Total – *Fiction*	26	54.04	2.00
Total – *Nonfiction***	32	63.13	1.80

**p<.01

Note: The maxim score is 84. F/F = Fiction Expectation / Fiction Text; NF/NF = Nonfiction Expectation / Nonfiction Text; F/NF = Fiction Expectation / Nonfiction Text; NF/F = Nonfiction Expectation / Fiction Text. Covariates appearing in the model are evaluated at the following values: ART_F = 10.397, ART_NF = 5.293.

Table 4

Means and Standard Deviations on the Measure of Comprehension (Sentence-Verification Task) – Experiment 1

Condition	*n*	*M*	*SD*
F/F	13	11.48	.62
NF/NF	17	12.13	.55
F/NF	15	12.26	.60
NF/F	13	10.82	.63

Note: The maxim score is 16. F/F = Fiction Expectation / Fiction Text; NF/NF = Nonfiction Expectation / Nonfiction Text; F/NF = Fiction Expectation / Nonfiction Text; NF/F = Nonfiction Expectation / Fiction Text. Covariates appearing in the model are evaluated at the following values: ART_F = 10.397, ART_NF = 5.293.

Table 5

Means and Standard Deviations on the Measure of Empathy (Interpersonality-Reactivity Index Total) Pre- to Post-Reading Based on Genre Expectations

Genre Expectation	Time*	*M*	*SD*
Fiction	1	65.29	2.78
	2	66.53	2.91
Nonfiction	1	72.74	2.72
	2	71.03	2.84

* $p < .05$

Note: Covariates appearing in the model are evaluated at the following values: ART_F = 10.397, ART_NF = 5.293.

Experiment 1-Qualitative Analysis

In addition to calculating changes in the dependent variables, participants were asked if they believed the story they read was in fact the genre they were told it was in the task instructions. They were then asked to "Please explain your answer to the previous question." In Experiment 1, the breakdown of participants who correctly identified the genre of the story is as follows (Genre expectation/Text genre):

1) Fiction/Fiction: 99 percent of participants agreed the story they read was fiction and stated reasons corresponding to its literariness. Below are some of the participant responses.
    (1) *The style of writing.*
    (2) *…seemed specific and literary*
    (3) *The story had the flow of a work of fiction, not a true story.*
    (4) *The way that language was used made this story seem like a work of fiction.*
    (5) *...because the story kept me in suspense like the fiction work should.*

2) Nonfiction/Nonfiction: 67 percent of participants agreed the story they read was nonfiction. A sample of responses from each group is below.

i) Participants who correctly identified the story as nonfiction gave much more varied reasons for their answer.

(1) *…although descriptive like a book, it had the facts and scenery to make believe it to be true.*

(2) *I think it sounds so unbelievable that it is most likely true. I really liked the story and felt a little bit sad for Phineas.*

(3) *It is very informative.*

(4) *I believe this was a work of nonfiction because of the amount of detail and the way the story was told in a historical narrative.*

(5) *It seems crazy enough to be true. If Trump can become president, anything is possible.*

ii) Interestingly, the participants who disagreed that the story was nonfiction stated issues with the story's believability (i.e., Phineas' accident was too extreme to be plausible). Since many participants who correctly identified the story as nonfiction also justified their answer with the story's believability, this suggests a greater degree of variability in reader standards for nonfiction in comparison to fiction.

(1) *I think it was cleverly written but I don't think it was true because that would have been a miracle story that I think I would have heard about at some point in my life…I don't think that even today someone could survive a tragedy like that.*

(2) *I'm assuming it wasn't a true story. Amazing if true!*

(3) *It seems too extreme to be true.*

(4) *It just didn't seem believable.*

3) Fiction/Nonfiction: 53 percent correctly identified the story genre as nonfiction despite the manipulation. However, all these participants indicated some degree of familiarity with Phineas Gage and his story.

   i) Of the remaining 47 percent who believed the manipulation, half supplied reasons very similar to those on the Nonfiction/Nonfiction condition who incorrectly identified the genre as fiction due to a lack of believability.

      (1) *This story seems imaginary because of the severity of the injuries.*

      (2) *It just seems really hard to believe something like that would really happen to someone and they would survive.*

   ii) The other half, however, gave explanations that indicate the manipulation in the task instructions was sufficiently convincing.

      (1) *It was presented as a fiction short story, so I believe it was.*

      (2) *Because the story plot is very fictional.*

      (3) *I believe the story was a work of fiction because it was stated that it was.*

4) Nonfiction/Fiction: 36 percent of participants correctly identified the story genre as fiction despite the manipulation.

   i) For the participants who did not buy the manipulation, overall their responses suggest that the story's literariness was the primary influencer.

      (1) *It sounds like fiction.*

(2) *I believe the story was entirely fictional. I do not really know exactly why. It is just the impression I got from it.*

(3) *It could have been nonfiction but read like a novel. I lean toward novel.*

ii) The remaining 64 percent of participants, however, believed the manipulation. The explanations provided by these participants suggest the genre manipulation worked to influence how readers processed the story by adopting standards typically associated with the nonfiction genre.

(1) *I think that it is nonfiction because there is too much detail as far as being realistic for it to be fiction.*

(2) *Everything in the story was more real than not.*

(3) *There is no reason to believe it is not so. The story is very plausible.*

(4) *It is [a] very informative story.*

Taken together, these responses support the broader, and uncontroversial, idea that readers apply genre-specific standards of coherence to narratives they read. More importantly, these responses indicate that those standards of coherence can be influenced by genre expectation. Furthermore, it does not take much to influence them, just the words—fiction and nonfiction. The task instructions before reading each narrative stated, "You will now be presented with a short [fiction/nonfiction] story, after which you will complete a brief set of tasks about the reading. Please read the following short [fiction/nonfiction] story at a leisurely pace." This was the only paratextual indication of the genre that participants were exposed to.

As expected, most participants did not struggle to identify the genre correctly when they were in a control group. In the manipulation groups these numbers dropped

significantly, to 53 and 36 percent correctly identifying the genre in the fiction/nonfiction and nonfiction/fiction groups, respectively. However, in the case of the fiction/nonfiction group, the percentage of correct genre identification in this group was solely a factor of participants having familiarity with the story and main character prior to the partaking in the experiment, rather than them picking up signals from the text's nonfiction features to counter the manipulation. This familiarity was unanticipated, and was addressed in the second experiment by redirecting potential participants away from the study if they responded to yes to the question, "Do you recognize the name Phineas Gage?"

In the nonfiction/fiction group, the participants who did not fall for the manipulation cited reasons indicating that they picked up on the fictionness of the story; the fiction features of the text, content and style, were evident enough that when prompted, they could identify the genre as fiction correctly. Two thirds of participants, however, did not do this. Instead, they continued to believe the story was nonfiction even after being prompted to consider it might not be. In addition, their explanations support the hypothesis that how a narrative is processed by a reader can be predicated on their genre expectation prior to reading the narrative.

These participant responses provide interesting insight into how genre expectations establish a framework for processing narratives. At first glance, it seems readers may have a better detection for the features and standards of fiction than nonfiction since it was easier to influence readers that a story was nonfiction than fiction. Also, the third of participants in the nonfiction/nonfiction group who mistook the story for fiction, provided explanations regarding its believability that bring up questions for future consideration regarding the entangled role of belief and realism in fiction and

nonfiction[22]. Finally, regardless of whether participants correctly identified the genre or not after reading, the changes in pre- to post-reading on empathy were still influenced by genre expectation, suggesting that genre expectations exerted their influence on the online processing of the texts. It also raises the question of how likely are readers to recognize they were misled about a narrative's fiction or nonfiction value, unless specifically prompted to consider the possibility after reading. However, it is important to note that these analyses are tempered by the small sample size in Experiment 1, which is why the participant pool was doubled in Experiment 2.

Experiment 2-Statistical Analysis

A series of 2x2 ANCOVA were conducted with genre expectation and text genre as the independent variables, print exposure in each genre (ART) as the covariates, and comprehension (SVT), transportation-short form, and narrative engagement as the dependent variables. The analyses showed that there were no genre expectation or text genre effects on comprehension, transportation, or narrative engagement (*all p*s > .05). The results, in part, contrast the findings in Experiment 1 in which there was a significant effect of text genre on transportation. In Experiment 2 only, a Pearson's r was also computed to assess the relationship between the transportation and narrative engagement. There was a strong correlation between the Transportation-Short Form and Narrative Engagement scales, ($r(124) = .80$, $p < .01$).

A 2x2x2 ANCOVA also was conducted with genre expectation, text genre, and time (pre- to post-reading) as the independent variables, print exposure in each genre (ART) as the covariates, and empathy (IRI scale) as the dependent variable. The analysis

[22] This idea will be explored in the Chapter 6.

showed there were no genre expectation or text genre effects on empathy from pre- to post-reading (*all ps* > .05).

Table 6

Means and Standard Deviations on DVs: Transportation, Narrative Engagement, and Comprehension (SVT) Across All Conditions – Experiment 2

	Genre Expectation	Genre Read	*M*	*SD*	*n*
Transportation	F	F	33.33	1.375	28
		NF	32.30	1.269	33
	NF	F	31.39	1.330	30
		NF	32.79	1.267	33
Narrative Engagement	F	F	64.46	2.072	28
		NF	63.09	1.912	33
	NF	F	63.03	2.004	30
		NF	62.92	1.909	33
Sentence Verification Task	F	F	10.78	.434	28
		NF	10.85	.401	33
	NF	F	10.40	.420	30
		NF	11.19	.400	33

Note: F = fiction and NF = nonfiction. Covariates appearing in the model are evaluated at the following values: ART_F = 8.750, and ART_NF = 4.685.

Table 7

Means and Standard Deviations on the Measure of Empathy (IRI) – Experiment 2

Genre Expectation	Genre Read	Time	*M*	*STD*
F	F	1	70.12	2.68
		2	70.23	2.67
	NF	1	67.52	2.47
		2	67.2	2.46
NF	F	1	67.85	2.59
		2	66.69	2.58
	NF	1	68.79	2.46
		2	68.4	2.46

Note: F = fiction and NF = nonfiction. Covariates appearing in the model are evaluated at the following values: ART_F = 8.750, and ART_NF = 4.685.

Experiment 2-Qualitative Analysis

As in Experiment 1, I presented a check to see how many participants bought the genre manipulation and asked them to provide an explanation for their choice. Though Experiment 2 did not yield significant differences from pre- to post-reading on the dependent variables, participant responses still overwhelmingly indicate the presence of the genre manipulation during processing.

1) Fiction/Fiction: 99 percent of participants (27/28) agreed the story they read was fiction and stated reasons corresponding to its fictional features. Below are some of the participant responses.
    (1) *It was more descriptive and immersive than I would expect from nonfiction.*
    (2) *The way it was written it seemed like a fictional story.*
    (3) *It carried itself like a work of fiction.*
    (4) *It didn't seem real to me because I felt like if the boy was a real person he wouldn't have disclosed so much about his disdain for his father.*
    (5) *The narrator was telling the story more from a fictional perspective than real…*
    (6) *It sounds like something from a novel set after WWI, based on realistic events but with fictional characters.*
    (7) *I believe it was a work of fiction because it felt like something that would not usually happen in real life or would happen very rarely.*
2) Nonfiction/Nonfiction: 73 percent of participants (24/33) agreed the story they read was nonfiction. A sample of responses from each group is below.

(1) *Obviously, I have no way of telling so I have to base my decision on the writing style, which was clearly nonfiction.*

(2) *Too real not to be true. It had too many points right on target which made it all the more telling.*

(3) *It was so detailed. It feels like it really happened.*

(4) *It seems so realistic, plus it brings in Lister, Pasteur, and Barnum in historically correct roles, so it seems authentic and not fiction.*

(5) *The story seemed like a real historical account and medical phenomenon of what actually happened to this poor man. It read like a newspaper or a magazine article.*

ii) As in Experiment 1, participants who disagreed that the story was nonfiction indicated issues with the story's believability.

(1) *I don't believe the story was true, I don't have much of a reason why, but it just sounded fake.*

(2) *…it is an unbelievable nonfiction.*

(3) *Because I don't believe that could have really happened.*

3) Fiction/Nonfiction: 69 percent (22/32) percent correctly identified the story genre as nonfiction despite the manipulation. The majority of responses suggest longer exposure to the text increased reader sensitivity to nonfiction features and content of the narrative. A sample of responses is below.

(1) *Just sounds real and plausible and has enough historical details.*

(2) *It sounded pretty realistic.*

(3) *The way the story was written, how detailed it was about the accident and the time period, led me to believe that it was, indeed, a true story.*

(4) *It seemed like an account or a real person.*

i) Of the remaining 31 percent who believed the manipulation, the reasons again corresponded to believability.

(1) *Some of the scenes described in the story are consistent with fiction and cannot actually happen in real life*.

(2) *…because I don't see how he could have survived the accident that happen to him. It all seems made up in certain parts.*

(3) *It didn't seem like something that would be true.*

2) Nonfiction/Fiction: 40 percent of participants correctly identified the story genre as fiction despite the manipulation.

i) For the participants who did not buy the manipulation, overall their responses suggest that the story's literariness was the primary influencer.

(1) *The story seemed to make points and have themes from other writings, where the boy was in competition with his father for affection, it just did not seem like a nonfiction work.*

(2) *It sounded like a novel.*

(3) *It reads too much like a fictional tale.*

(4) *To me it definitely seemed like a work of fiction. Maybe it was the style of writing, but I definitely felt it was fiction.*

ii) The remaining 60 percent of participants, however, believed the manipulation. The reasons for this answer were more varied and developed than in

Experiment 1. Some participants focused on the story's realism. Others took this notion a bit farther to suggest the story was nonfiction in the sense it could be autobiographical and/or historical.

(1) *It felt quite real in every aspect, from the time period to the settings and issues that were involved.*

(2) *It sounded too real to be fake.*

(3) *It sounds very much like it could have been nonfiction. There was a lot of detail.*

(4) *I assume it is an old memoir? It's a believable story from WWI.*

(5) *It seemed like a written tale of the author's young life.*

(6) *Because back in the 2 world wars, stories like this could very likely happen.*

Since the texts were doubled in length in Experiment 2, readers had much more exposure to genre-specific features and content of each story. In the case of the nonfiction story, its nonfiction features were much more prevalent than in Experiment 1 due to the inclusion of more exposition and factual material. In the case of the fiction story, the extended length meant the inclusion of more dialogue and access to the narrator's inner monologue. Therefore, we would expect readers to do better at catching the manipulation when prompted. The question is: how much better and would this vary between the two manipulations?

Readers were more successful at correctly identifying the genre, but only significantly so in the fiction/nonfiction condition. From Experiment 1 to Experiment 2,

this group improved by 16 percent, from 53 to 69 percent, respectively. Participants also improved in the nonfiction/fiction condition, but only by 4 percent, from 36 to 40 in Experiment 1 and 2, respectively. Collectively, these results strengthen the notion that readers' standards for fiction are more rigorous than their standards for nonfiction; readers were more willing to fit the fiction story into nonfiction standards than vice versa. In both experiments, participants were less likely to believe the nonfiction story was fiction, and even less so when reading the longer text. Conversely, participants were more likely to believe the fiction story was nonfiction, an outcome that did not change with the longer text. As in Experiment 1, realism and believability played a role in the reasoning readers applied to justify their choices.

General Discussion

We examined whether genre expectations and text genre (fiction, nonfiction) influence participants' empathy, transportation, and comprehension. In Experiment 1, the results showed that empathy was influenced by genre expectations, whereas transportation was influenced by text genre; there were no effects on comprehension. Specifically, participants with a fiction expectation reported higher empathy after reading, whereas participants with a nonfiction expectation reported lower empathy after reading. Interestingly, participants who read nonfiction reported significantly higher transportation than participants who read fiction. After identifying a genre expectation effect on empathy in Experiment 1, it was decided to lengthen the text of both stories in Experiment 2 to test how more exposure to the material would alter this effect. Secondly, because of the unexpected transportation results in Experiment 1 (*NF Transportation: M = 63.13; F Transportation: M = 54.04,)* a Narrative Engagement Scale (Busselle &

Bilandzic, 2009) was added in Experiment 2 to provide a comparison measure to the Transportation Scale (Green & Brock, 2000). In Experiment 2, the effects identified in Experiment 1 did not replicate. These mixed results are discussed in further detail below.

Experiment 1

The findings in Experiment 1 support the hypothesis that genre expectation plays a role in how readers process fiction and nonfiction texts. Specifically, participants who had a fiction perspective when reading both fiction and nonfiction texts exhibited increases in empathy. In contrast, participants reading with a nonfiction perspective showed decreases in empathy from pre- to post-reading. Of note, this effect was also seen when isolating the Perspective Taking subscale of the IRI. However, genre expectations did not alter participant performance on comprehension, nor reported transportation.

Contrary to expectations, there was no effect of text genre on empathy from pre- to post-reading. There was a significant effect of text genre on transportation, but it was in the opposite direction as expected. Participants who read nonfiction reported higher levels of transportation than participants who read fiction. How these results fit into the body of evidence on the link between reading fiction and enhanced empathy requires further study, since these findings are at odds with results obtained in other experiments that support the link between reading fiction and enhanced empathy, as well as the claim that transportation moderates those outcomes (Bal & Veltkamp, 2013; Johnson, 2013). The results of the present study suggest that transportation may not, at least not always, be a predictor of changes in empathy. These unanticipated results led to the decision to also include the Narrative Engagement scale in Experiment 2 to try and discern if the Transportation Scale is in fact capturing transportation, or perhaps something else, such

as Narrative Engagement. The Transportation Scale was still used in Experiment 2, but in a shortened form with 6 items instead of 12. The shortened form of the scale was developed after conducting a factorial validity analysis and exploratory bifactor modeling of the Transportation Scale (Green & Brock, 2000); the short form was also assessed for reliability and validity (Appel et al., 2015).

Experiment 2

Experiment 2 failed to replicate both effects identified in the first experiment even though the texts participants read were longer to encourage deeper processing. Genre expectation did not influence empathy outcomes as measured by the IRI from pre- to post-reading. Text genre also did not influence empathy outcomes as measured by the IRI from pre- to post-reading. Contrary to expectations, no significant differences were found in any of the four conditions in the IRI from pre- to post-reading.

In addition, there were no main effects on transportation in any of the four conditions either. This also does not mirror the results of Experiment 1 in which participants who read nonfiction reported significantly higher transportation scores than participants who read fiction. In Experiment 2, participants in all four conditions recorded comparable scores across all measurements. This also applied to the added measurement of Narrative Engagement. The longer texts seem to have levelled the effects obtained in Experiment 1, which suggests that the perspective effect may be transient and fragile.

Interestingly, the Transportation-Short Form and Narrative Engagement Scales were highly correlated. With such a strong correlation between two instruments professing to measure different components of engaging with narrative, an important follow-up question for the field is: What are these instruments actually capturing?

Limitations

One of the limitations of the current study was the lack of controlled reading environment for participants. Participants were recruited with Amazon's Mechanical Turk (MTurk), an online platform that allows individuals to select Human Intelligence Tasks, or HITs, to complete of their own choosing at any location via Internet access. The freedom to take the survey online in any location increases the chance that participants encounter disruptions or may be generally more distracted during reading, which may impact the likelihood of participants becoming immersed in the storyworlds of the narratives they read. To decrease this likelihood, qualification parameters were set to allow only MTurk workers with an 80 percent or above approval rating, and who had completed more than 500 HITs, to take the survey. A time limit was also placed on the survey to prevent participant responses that extended over too long a time period, which would indicate they did not complete the task in one session. Further, comparison studies using MTurk participants and traditional lab settings to complete the same tasks, provide evidence of the validity of MTurk data and indicate that the majority of MTurk workers are motivated to not simply click through surveys to attain the incentive (Buhrmester et al., 2011; Kaufmann et al., 2011).[23] Still, ideally future replications and extensions of these experiments would also be conducted in a controlled traditional lab setting to increase the generalization and stability of the findings.

Another limitation of this study was participant familiarity with the nonfiction story. This limitation was identified in Experiment 1 when more than 50 percent of the participants who read the nonfiction story cited familiarity with the narrative. To address

[23] MTurk was also used by some of the studies discussed in this thesis (Johnson, 2013; Kidd & Castano, 2013; Panero et al., 2016)

this problem in Experiment 2, participants were asked if they recognized the name Phineas Gage prior to beginning the survey. If they responded yes, then they were prevented from going further in the survey.

A third limitation of these experiments relates to the limitations of the IRI scale and its psychometrics. The four subscales of the IRI—perspective taking, empathic concern, fantasy, and personal distress—were note validated using a factor analysis, and as a result, a single score was used in the analysis. Future research needs better scales to isolate the sub-constructs of interest, especially perspective taking.

Research Implications and Future Directions

The results of the current study are surprising in a couple ways. First, in accordance with other studies that investigated the link between empathy and transportation, it was expected that the degree of transportation would be related to empathy and also that participants who read fiction would report higher levels of transportation than nonfiction. In both experiments, transportation was not strongly related to empathy outcomes. In addition, transportation was not higher for readers of fiction than nonfiction. In fact, in Experiment 1, transportation was actually significantly higher for readers of nonfiction than fiction; in Experiment 2, both groups reported comparable levels of transportation.

These results contradict the findings of other studies that identified a correlation between transportation and empathy, as well as the idea that fiction is more likely to induce transportation than nonfiction (Bal & Veltkamp, 2013; Johnson, 2013; Djikic et al., 2013; Mar et al., 2009; Green et al., 2004). The implication of the current study is that while transportation continues to be a feature of the narrative experience, assuming an

automatic division between its role in fiction versus nonfiction is problematic because it does not take into account the narrative range of both genres. In this study, a narrative nonfiction short story with human actors was specifically chosen rather than news articles or purely expository pieces for the nonfiction reading group. By using a nonfiction text with content and features that still strongly distinguish it as nonfiction, but that also has human actors and uses narrative storytelling techniques, this study presented readers with a text representative of most nonfiction readers access today—long-form literary journalism, magazine articles, memoires, biographies, and so forth.

The transportation results suggest that future studies aiming to delineate differences between fiction and nonfiction reading should take into account not just the identification of the text as nonfiction or fiction, but the narrative features of those texts. Also, by using a nonfiction text that was not blatantly nonfiction by virtue of its form alone (i.e., news articles), the hope was to isolate the impact of the genre expectation manipulation from the text content and features.

Future studies could contribute to the delineation between fiction and nonfiction reading experiences by including conditions with multiple nonfiction comparison texts that encompass a range from expository nonhuman nonfiction to narrative nonfiction with human actors. In addition, future extensions and replications of this study should include different texts as well to determine that the results were not solely a function of the texts and to explore the extent that genre expectations can exert an influence on the reading process and potential outcomes.

The second surprising result of these experiments also troubles the generic fiction and nonfiction divide that has pervaded this field. Reading fiction did not significantly

improve empathy in either experiment. In Experiment 1, being told you were reading fiction influenced positive changes on empathy post-reading but there was no main effect of the fiction text itself on empathy. Conversely, being told you were reading nonfiction led to decreased empathy post-reading but there was not a main effect of reading the nonfiction text either. Again, this result contradicts other findings in the field that suggest reading fiction versus nonfiction positively influences prosocial cognition, like empathy and perspective taking.

The second experiment found no changes from pre- to post-reading on empathy outcomes, either as a function of the text genre or genre expectation. This is particularly surprising since the stories were much longer in Experiment 2. It was expected that the increased reading time would deepen processing and draw out the genre expectation effects identified in the first experiment. Instead, longer exposure to both texts diluted the effect. This suggests the influence of genre manipulations may be transient and fragile, which actually aligns with Zwaan's (1994) findings since the stimuli he used averaged 216 word. To look into this possibility, the next experiment will shorten the length of both texts. It will also be imperative to use additional texts in each condition to improve the understanding of this study's findings and their generalizability.

Overall, the results of this study bring to light the role of genre expectation in processing fiction and nonfiction texts and suggest genre expectation is an important factor that future studies should take into account when investigating the reading experience. The unexpected empirical results across experiments, in combination with participant performance on correctly identifying the text genre, raise more questions than

answers. In particular, this study raises some caution about drawing conclusions about the relationship between transportation and empathy, and transportation and genre.

The strong correlation between transportation and narrative engagement also means that additional research is needed to delineate the difference between these two constructs. What does transportation truly entail? Vivid mental imagery only, or mental imagery plus emotional investment in the story, or mental imagery plus emotional investment plus identification with the characters? Finally, though reading narratives can impact readers, this study provides evidence that this is not always the case. Discerning the conditions that lead to improvements on prosocial cognition requires much more research. Though this investigation of processing fiction versus nonfiction narratives may have elicited more questions than answers, it underscores the importance of continuing empirical studies of narrative to better understand their underlying mechanisms and potential influences on the reader.

CHAPTER 6: FRAMING THE FICTION/NONFICTION DIVIDE IN THE CONTEXT OF (DIS)BELIEF

This project began with the basic premise that narrative matters, that the stories we read can shape us in a variety of interesting ways by fostering a simulated experience for the reader because narrative is a mode of cognition. But from this premise, two very large questions arise: 1) Which stories have this potential and why? and 2) What are the tangible, and possible, cognitive outcomes of reading narratives (if we are in fact so influenced by them)? The experiments conducted in this thesis carved out a thin slice of those overarching questions by focusing on two conditions that inform our reading experiences, genre expectation and story genre—fiction or nonfiction. While the previous chapter addressed future directions for additional empirical studies, the findings also evoke a need to address the theoretical underpinnings of this thesis—the division between fiction and nonfiction.

In contemporary culture, the shifting and blurring of boundaries between subjectivity and objectivity, or instances of fiction and nonfiction, is increasingly prevalent. This is evidenced by a few troubling trends: 1) the rise of fake news—intentional and coordinated dissemination of false information that is presented to the public as if it is true, objective, and nonfiction[24]; 2) the coopting of the term "fake news" with the aim to delegitimize actual information (e.g., facts) by labeling it as "fake", or as fiction; and 3) the increase in the spread of misconceptions, accompanied by the

[24] The trend to spread misinformation has been widely tracked in the last year, and has resulted in the development of guides, like "5 Ways to Spot and Stop Fake News-Don't Get Taken In" (http://guides.library.harvard.edu/fake), and websites dedicated to fact checking have also become more active to counter disinformation campaigns (e.g., fakenewswatch.com, factcheck.org, and politifact.com). It also now commonplace to see Fact Check headlines across media platforms, which speaks to the very present battle between true and false narratives in the public eye.

persistence and strength of belief in those misconceptions among the general public[25]. The proliferation of misinformation also contributes to the inability of readers to successfully draw distinctions between real, or evidence-based, and manufactured information. This concern is further complicated by the fact that some readers partake in this practice willingly by seeking out information that supports an existing belief. Taken together, these trends result in competing knowledge representations between true and untrue information that are difficult to reconcile, and overcome, even in laboratory settings with designed materials and learning goals (Trevors et al., 2016; Sinatra & Seyranian, 2016; Nyhan & Reifler, 2015)[26]. The literature so far indicates that conceptual change researchers have many challenges ahead in efforts to attain successful knowledge revision.

When Fiction Becomes a Category

The shifting boundaries of objectivity and subjectivity in nonfiction and fiction is not a new phenomenon, however. Readers have been navigating the difficulties stemming from the fact that "the primary categorical division in our textual universe is between 'fiction' and 'nonfiction'" (Gallagher, 2006, p. 336), for hundreds of years. In the insightful chapter, "The Rise of Fictionality" (2006), Catherine Gallagher makes the case

[25] A prime example of this is the uptick in misconceptions about perceived dangers of vaccines, a public health problem that actually led the U.S. Committee on Health, Education, Labor, and Pensions to hold a hearing addressing this issue February 10, 2015. The outcomes of that hearing were recently drafted into a report, "The reemergence of vaccine-preventable diseases: exploring the public health successes and challenges" (2017).

[26] For additional reading on conceptual change research, especially regarding socioscientific, or warm misconceptions like climate change, also see Lewandowsky's article, "Future global change and cognition" (2016); Lewandowsky et al. (2012); Sinatra et al. (2014). The expansion of this research in the last few years speaks to increased concern about the problem of misconceptions in educational settings, as well as their potential impact on society.

that the fictionality of 18th century British works was so unique that it jointly established conceptions of the novel and of fiction that cannot be disentangled. She writes:

> The novel is not just one kind of fictional narrative among others; it is the kind in which and through which fictionality became manifest, explicit, widely understood, and accepted. The historical connection between the terms *novel* and *fiction* is intimate; they were mutually constitutive. (p. 337)

That description makes the development sound like a simple one, but as Gallagher shows, it was complex and often murky. Readers[27] were put in a position that required them to oscillate between old and new understandings of truth while authors played with a story's believability in innovative, but often confusing, ways. Before the mid-18th century, "the only reliable 'operator' of fictionality was mere incredibility [while] believability was tantamount to a truth claim" (2006, p. 339). In other words, if the plausibility of a narrative was high then readers believed the story referred to real individuals and made "particular referential truth claims" about these individuals. Furthermore, readers were typically *expected* to believe the supposed characters in the story represented actual people since most 17th and early 18th century narratives "were meant to be read either as factual accounts or as 'allegorical' reflections on contemporary people and events" (p. 339). By making a truth claim, narratives prior to the establishment of the conceptual category of fiction were thus positioned to be, and understood as either true representations or lies.

Writers of fiction were thus tasked with differentiating their work from libel while also retaining plausibility, which meant convincing readers to process stories about "purely imaginary individuals" by repackaging narratives to be "believable stories that

[27] A similar statement applies to authors, and what that entailed is fascinating in its own right, but for the current purposes I would like to maintain a focus on the impact on readers specifically.

did not solicit belief" (340). This was no easy task considering that literary predecessors engaged in intentional deception of their audience by making false truth claims, or conversely, claiming that their writing was fictional to avoid accusations of libel.[28] As Gallagher writes:

> In England, between the time when Defoe insisted that Robinson Crusoe was a real individual (1720) and the time when Henry Fielding urged just as strenuously that his characters were not representations of actual specific people (1742), a discourse of fictionality appeared in and around the novel, specifying new rules for its identification and new modes of nonreference. And it is on the basis of this overt and articulated understanding that the novel may be said to have discovered fiction. (p. 345)

These instances were emblematic of the "'news-novel matrix'—a tangled mess of journalism, scandal, and political and religious controversy" (Gallagher, cited Davis 1983, p. 340) and they prefaced the impending, and simultaneous, development of the novel and fictionality. Also accompanying the arrival of the novel was an expansion of "the idea of truth to include verisimilitude" (Gallagher, cited McKeon 2012, p. 341), which was "part of a larger epistemological shift from a narrow construction of truth as historical accuracy to a more capacious understanding that could include truth conceived as mimetic simulation" (p. 341).

Readers of the novel had to be guided through this new process of reading that sought the "just right" goldilocks level of believability. If authors were successful, then a reader "is dissuaded from believing the literal truth of a representation so that one can instead admire its likelihood and extend enough credit to buy into the game" (p. 346). Gallagher discusses this transition as a development of contained disbelief among

[28] Gallagher provides examples of both instances, including Daniel Defoe who claimed *Robinson Crusoe* (1719) was a historically accurate narrative about a real person, and Delarivier Manley who "declared that she had published a mere work of the imagination when she was prosecuted for libeling prominent aristocrats in 1709" (329).

readers. Gallagher leans on Samuel Taylor Coleridge (1817), who famously coined the term "the willing suspension of disbelief,"[29] when she writes, "Disbelief is thus the condition of fictionality, prompting judgments, not about the story's reality, but about its *believability*, its plausibility" (p. 347). This noncritical form of disbelief, or "self-induced susceptibility," provided a way for readers of the burgeoning novel to recognize a story as fiction *without rejecting its realism,* so that "knowingly reading a novel [would] not involve the continuous activity of negating its objective correspondence to reality" (p. 348). Instead, reading a novel entails suspension of typical real-world disbelief to enable a disbelief tailored to the reality presented in the fiction and contained to the momentary act of reading.

Disbelief-Suspended or Constructed?

Gallagher's claim has significant merit. Readers of the time certainly had to establish a new method for reading fiction in order to understand these new narratives as neither fact nor outright deception, which entailed a complex reconceptualization of verisimilitude in light of the novel's realism. Notably, the suspension of disbelief did not arrive in a vacuum exclusive to the novel. The concept was fueled by modern developments, such as paper money. Playing the game was not just limited to fiction. "Indeed, almost all of the developments we associate with modernity—from greater religious toleration to scientific discovery—required the kind of cognitive provisionality

[29] Coleridge coined the term, willing suspension of disbelief, in *Biographia Literaria* (1817). Though Coleridge discussed the concept in the context of poetry, it has become widely used and understood as an action performed by readers or views of anything unbelievable in order to process, and enjoy, the unbelievable on the basis of its fictional premises, rather than reality. Getting readers to believe the unbelievable was a concern for Coleridge because of the rise of realism and rational thinking during the Enlightenment. An intriguing extension of the current project would entail tracing the arc of realism over time to consider its correlation to shifts in literary narratives as well as adaptations in readers' use of disbelief.

one practices in reading fiction, a competence in investing contingent and temporary credit" (Gallagher, p. 347). Gallagher provides a convincing analysis that the game of fiction was unique specifically because it solicited:

> …a *willing* suspension of disbelief, and this sensation of individual control over disbelief set novel reading apart from those mandatory suppositional acts that required the constant maintenance of active skepticism. Detaching incredulity from the guarded wariness that normally accompanies it, one could use it as a protective enclosure that would cordon off imaginary yielding from any dangerous consequences. (p. 348)

The establishment of the category of fiction and the novel's fictionality fostered an understanding of disbelief that readers could tap into consciously to read fiction as fiction.

At least, that was the case initially, in fiction's earliest moments. But after that? Does Coleridge's willing suspension of disbelief continue to dominate how readers process fiction? Richard Gerrig (1993) argues against that very notion in *Experiencing Narrative Worlds: On the Psychological Activities of Reading*. In this work, based on empirical findings and theoretical analysis, Gerrig contends that "readers naturally experience narrative information as continuous with information gleaned from real experience and thus must exert themselves consciously to regard fictive narratives as fictional" (Keen, 2013, para. 8). This position has received additional empirical support as well (Prentice & Gerrig, 1999; Prentice et al., 1997; Gerrig, 1993). Gerrig and Rapp (2004) extend this line of work in which they intentionally contrast Coleridge's notion of "the willing suspension of disbelief" to instead posit that readers engage, at times, in "the willing *construction* of disbelief" (p. 267-268, emphasis mine). According to the authors, this construction entails an active and effortful process on the part of the reader to remember the work is fictional. In addition, they also claim that readers are not naturally

inclined to partake in this process, which "leaves open the question of under what circumstances readers expend effort to construct disbelief" (p. 268).

The crucial distinction between these contrasting views of disbelief—suspension versus construction—concerns the reader. The construction view asserts that the reader's default mode for processing narrative, including fiction, is belief or acceptance. In this view, the need for suspended disbelief to process fiction as fiction is not considered necessary. Instead, readers can be prompted to engage in a conscious and active construction of disbelief.[30] However, doing so is unlikely both since it is effortful and would only be of use as part of a specific reading goal (e.g., an analysis of Marxist ideology as portrayed in Tolstoy's *War and Peace*). In contrast, the suspension view stems from the premise that the reader's default mode for processing narrative is disbelief; the reader enters narrative processing as a skeptic who is expected to check representations against real-world knowledge to assess validity. With the arrival of novel's fictionality, engaging in the suspension of that disbelief was a necessary solution for readers to grasp the complexity, and successfully navigate, the demands of this new narrative form.

The initial struggle for the reader involved recognizing fiction's fictionality in order to process fiction as fiction, according to Gallagher. According to Gerrig, readers do not process fiction as fiction unless they actively remind themselves the story they are reading is fictional. Instead, he believes we process fiction the same way we process any other narrative information, and he further claims that this state of processing is one of

[30] The authors posit a correlation between the likelihood of construction disbelief to a reader's degree of transportation, but the empirical support for this idea is murky. Research on other factors, like familiarity with the location of the storyworld, has also produced mixed findings. Overall, more research on the theoretical notion of construction of disbelief, to discern its properties and how it may function, is needed.

noncritical belief. At the starting point, Gallagher's reader was too skeptical, and needed to find a way to harness that skepticism appropriately to read fiction, hence the need for the willing suspension of disbelief. Nearly 300 years later, Gerrig's reader on the other hand, lacks skepticism, hence the need for the willing construction of disbelief. Both of these positions have merit, but neither adequately captures the complexity of how readers process fiction versus nonfiction in the current cultural context. While the tension between these positions on disbelief is problematic, I hope to suggest that it is not irreconcilable.

A New Cultural Imperative

Reclaiming the Division Between Fiction and Nonfiction

The time between the opposing notions—the willing suspension of disbelief vs. the construction of disbelief—is the key to resolving this tension. Rather than debate which one of these notions of how readers apply disbelief is correct, I wish to suggest that there is not a debate to be had once we consider the context of the mid-18th century reader to the contemporary reader. In other words, disbelief should not be considered a static concept, but one with a developmental and context-dependent trajectory.

The early readers of the novel needed an explicit strategy to comprehend fiction as fiction. The willing suspension of disbelief was not merely an optional exercise, as Gerrig suggests with the construction of disbelief, but a pivotal tool that allowed readers to enter storyworlds and experience them without constantly having to question their truth value in relation to realities of the external world. This analysis makes even more sense when we consider how new and different the novel and its fictionality were in comparison to prior narrative forms. Fiction had to establish a distinctive identity as a

new narrative form apart from nonfiction and fantasy (e.g., fairytales), and in doing so, it made *new* demands of its readers. As Gallagher writes, a "cultural imperative" fostered the rise of the novel and its fictionality, the establishment of fiction as a category, *and* how the reader adapted to deal with those changes.

With that moment, the categorical division between fiction and nonfiction embedded its imprint on literary culture and on readers. The division still stands, but faces considerable scrutiny in contemporary times due to its vastly increased complexity. While we retain the division, one can argue it has almost been reduced to pure pragmatism. The seemingly clear-cut simplicity of the "Fiction" and "Nonfiction" labels in the bookstore does not capture how severely blurred the lines between fiction and nonfiction, or subjectivity and objectivity, have become. Again, adapting a developmental perspective is useful. It is difficult to imagine now, when fiction narratives are so commonplace, and fictionality so pervasive in most every instance of discourse, that fiction as a category was ever small, or for that matter, new.

But the shear exponential growth of the category of fiction since the mid-18th century needs to be considered. Less than 300 years ago, the formal category of fiction had to stake its claim and establish a distinct identity from nonfiction and fantasy based on its self-contained and non-referential (but somehow also universal) realism. Furthermore, the category was founded with a fairly small sample size, especially in comparison to how many fiction titles I now have access to in the average bookstore. The volume of fiction narratives exploded in the 19th century thanks to technological innovations that lowered the cost of printing books and was accompanied by higher levels of literacy among the populace.

Not only are fiction books exceedingly commonplace now, but after the category of fiction was established, it did not take long for fiction to develop an expanse of subgenres that make their own contributions to the blurring of boundaries between fiction and nonfiction, especially memoire and historical fiction. It also seems very unlikely that the escalated popularity of these genres in recent times is merely coincidental with the parallel weakening of the fiction/nonfiction divide.[31]

In addition to the infiltration of nonfiction elements into the realm of fiction, over time distinctive elements of fiction have also permeated the nonfiction category. This is most evident in journalistic trends, such as the advent of New Journalism in the 1960s,[32] which was followed by an increasing role for literary journalism in more traditional outlets, to the current state of TV journalism—infotainment.

This brief and broad stroke timeline still manages to show that in less than 300 years we have managed to establish and erode the fiction/nonfiction divide to the degree that a reader today listens to news as entertainment while the 18th century reader had to develop a concept of fiction *and* a method for processing fiction just so that they could enjoy fiction as fiction.

Once we consider the state of the blurred boundaries between fiction and nonfiction today, it is not far stretched to suggest that the modern reader is navigating the brink of a new "cultural imperative" in which fiction has become so normalized as a

[31] A promising direction for future study would be a comparison of the sociohistorical contexts of times when historical fiction experienced high popularity (e.g., the 19th century with classics like *War and Peace*, and more recently, and the more recent peak in popularity of historical fiction).
[32] New Journalism is defined by its subjective approach. New Journalists did not report from a distance, but immersed themselves in the stories they told in order to tell a more 'true' story. Notably, works from New Journalists typically were/are printed in magazines rather than newspapers. The official starting point of New Journalism is typically linked to Tom Wolfe, who actually published a collection of these articles in the book, *The New Journalism* (1973).

mode of cognition that its very fictionality has truly faded into the background. Following this logic, an amended version of Gerrig's notion of the willing construction of disbelief makes more sense for the contemporary reader, who can be charged with believing too much and questioning too little—a significant problem in the current cultural context troubled by the rise of deliberate fake news, disinformation campaigns, and misconceptions.

Gerrig mistakenly focuses on the need for readers to construct disbelief in terms of fiction processing, but the very fact that the modern reader does not need to engage in the willing suspension of disbelief indicates that the modern reader no longer needs a strategy for processing fiction as fiction. We have moved from the willing suspension of our disbelief, to an automatic unconscious suspension of disbelief as the game of fiction became easy and conventional, finally to, plain belief. Remember that the goal of suspending disbelief was to free the reader up to *believe* in the fictional storyworld in the closed context of the fictional storyworld. If it's the case that the new default mode for processing narrative is belief, this is not necessary antithetical to processing fiction as fiction; if belief is the new default mode, it's because we learned to process fiction too well. Therefore, the problem is not that the contemporary reader needs a strategy for processing fiction as fiction, like the 18th century reader did.

The new problem, the new cultural imperative, is that readers need to relearn how to read *nonfiction as nonfiction* because the fictional framework has become so pervasive over time that the new default mode of processing is dominated by fictional parameters rather than those of nonfiction. The results reported in the previous chapter also provide support for this notion. Readers' standards for fiction are both more rigorous and rigid,

whereas their standards for nonfiction appear to less sensitive to the material presented to them. Instead, the standards are driven by preconceived expectations of nonfiction's implicit truth value. Two thirds of the readers who were lied to and told they were reading nonfiction but actually read fiction, actively conceptualized the text within the framework of nonfiction *even when prompted to consider that what they read was not in fact true.* Taken together, the empirical findings and developmental trajectory of disbelief, suggest the division between fiction and nonfiction has not lost any complexity over time. The inner workings of that complexity have, however, changed.

Implications for future consideration

The problem of disbelief has turned back on itself. The 18th century reader had to learn how to read fiction as fiction, which meant learning how to read fiction with the goal of meaning-making rather than the goal associated with reading nonfiction, information extraction. The modern reader needs to relearn how to read nonfiction as nonfiction, with the aim of information extraction rather than meaning-making. Not surprisingly, these descriptions reflect Bruner's concepts of the narrative mode versus the logico-scientific mode of cognition. Upon further reflection, in light of the differing concepts of disbelief, aligning Bruner's narrative mode with fiction processing and the logico-scientific mode with nonfiction processing may be too blunt of an approach for untangling how the modern reader processes fiction and nonfiction narratives. Tracing the arc of disbelief suggests that when the division between fiction and nonfiction loses stability, readers adjust their processing strategies accordingly. Moving forward, when investigating how and why readers process fiction and nonfiction differently, it will be important to consider how those modes of processing have shifted over time, so that we

may also ask: What strategies can, or should, readers adopt when fiction contains truths and nonfiction contains lies?

Gallagher claimed the paradox of the novel was that it explicitly provided fiction, while simultaneously trying to hide that very fact. She writes, "the novel reader opens what she knows is a fiction because it is a fiction and soon finds that enabling knowledge to be the subtlest of the experience's elements. Just as it declares itself, it becomes that which goes without saying" (p. 349. Put another way, "the novel slowly opens the conceptual space of fictionality in the process of seeming to narrow its practice" (p. 340). While that paradox may be accurate to describe the early stages of the fiction category, the destabilizing of the fiction and nonfiction divide strongly indicates that fiction and its fictionality have done anything but narrow their practice. Instead, fiction has radically expanded its presence and its fictionality has infiltrated nonfiction to such a degree that readers may no longer even be using disbelief strategically, if at all.

The contemporary reader no longer needs strategies to process fiction as fiction if we have come to the point that belief is our default processing mode, and we are consequently more likely to process all narratives as fiction. The contemporary reader needs strategies to discern nonfiction from fiction, not the other way around. To this end, it may be time to revisit the epistemological shift that opened truth to mimetic simulation, and reign it in, before nonfiction completely loses its remaining stronghold, its distinctive identity and relationship to truth, in the narrative realm.

It is not particularly surprising that readers' genre-specific standards of coherence and believability are anything but static. What matters is how and why those standards shift. Those changes should elicit concern and further consideration because they impact

how readers cognitively construct fiction and nonfiction narratives. They also provide some insight into how readers toggle between ideas of truth in fiction and nonfiction frameworks. The anxiety at the onset of the novel revolved around how to extend the reader's concept of truth outside of nonfiction in a way that would enable fiction to be processed as fiction *and* achieve its own truth value. The current anxiety confronts the unanticipated consequences of that operation. We learned to read fiction as fiction, but not without damaging the disbelief necessary for processing nonfiction and the subsequent ability to successfully extract truthful information and discern lies.

The problem of truth value in fiction and nonfiction raises a new set of questions for research that explores the division between fiction and nonfiction narratives. Discovering the mechanisms underlying narrative processing and the potential cognitive outcomes of reading stories is essential, but lacking in the sense that it focuses on the how, and neglects the why. Future research must also take into account the context that constitutes why readers approach and process fiction and nonfiction narratives differently, in order to understand the implications of how those dynamics change to address fluctuations in truth and believability in fiction and nonfiction.

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APPENDIX A

Measurements Used in Experiments 1 and 2

A1. Author Recognition Test-Revised Items (Mar et al., 2006)

Fiction Items

Romance	Sci-Fi/Fantasy	Suspense/Thrillers	Domestic fiction	Foreign (in translation
Sidney Sheldon	Robert Jordan	Dean Koontz	John Updike	José Saramago
Danielle Steeler	Douglas Adams	John LeCarré	W. O. Mitchell	Yukio Mishima
Jackie Collins	Anne McCaffrey	Robert Ludlum	Alice Munro	Gabriel Garcia
Nora Roberts	William Gibson	Clive Cussler	Maeve Binchy	Albert Camus
Iris Johansen	Terry Brooks	Sue Grafton	Carol Shields	Umberto Eco
Diana Palmer	Piers Anthony	Ian Rankin	John Irving	Milan Kundera
Catherine Anderson	Arthur C. Clarke	P. D. James	Toni Morrison	Paulo Coelho
Joy Fielding	Ray Bradbury	John Saul	Amy Tan	W. G. Sebald
Nicholas Sparks	Ursula K. Le Guin	Patricia Cornwell	Rohinton Mistry	Italo Calvino
Judith Krantz	Terry Goodkind	Ken Follett	Sinclair Ross	Thomas Mann

Nonfiction Items

Science	Philosophy/Psychology	Political/Social-commentary	Self-help	Business
Stephen Hawking	Roland Barthes	Noam Chomsky	Jack Canfield	Faith Popcorn
Stephen J. Gould	John Searle	Norman Mailer	Philip C. McGraw	Jim Collins
Richard Dawkins	Jean Baudrillard	Michael Moore	M. Scott Peck	Napoleon Hill
Thomas Kuhn	Michel Foucault	Eric Schlosser	Robert Fulghum	Robert T. Kiyosaki
Ernst Mary	Bertrand Russell	Bob Woodward	Erma Bombeck	Stephen C. Lundin
Douglas Rushkoff	Antonio Damasio	Pierre Berton	Jean Vanier	Peter S. Pande

Amir D. Aczel	Daniel Goleman	Naomi Klein	Stephen R. Covey	Kenneth H. Blanchard
Matt Ridley	Jeffrey Gray	Naomi Wolf	Melody Beattie	Peter F. Drucker
John Maynard Smith	Joseph LeDoux	Robert D. Kaplan	Deepak Chopra	Barry Z. Posner
Diane Ackerman	Oliver Sacks	Susan Sontag	Marianne Williamson	M.D. Johnson Spencer

Foil Items

Lauren Adamson	John Condry	Martin Ford	James Morgan
Eric Amsel	Edward Cornell	Harold Gardin	Scott Paris
Margaritia Azmitia	Carl Corter	Frank Fresham	Richard Passman
Oscar Barbarin	Diane Cuneo	Robert Inness	David Perry
Reuben Baron	Denise Daniels	Frank Keil	Miriam Sexton
Gary Beauchamp	Geraldine Dawson	Reed Larson	K. Warner Schaie
Thomas Bever	Aimee Dorr	Lynn Liben	Robert Siegler
Elliot Blass	W. Patrick Dickson	Hugh Lytton	Mark Strauss
Dale Blyth	Robert Emery	Franklin Manis	Alister Younger
Hilda Borko	Frances Fincham	Morton Mendelson	Steve Yussen

A2. Interpersonal Reactivity Index (Davis, 1980)

28-items answered on a 5-point Likert scale ranging from “Does not describe me well” to “Describes me very well”. The measure has 4 subscales, each made up of 7 different items. These subscales are (taken directly from Davis, 1983):

- Perspective Taking – the tendency to spontaneously adopt the psychological point of view of others
- Fantasy – taps respondents' tendencies to transpose themselves imaginatively into the feelings and actions of fictitious characters in books, movies, and plays
- Empathic Concern – assesses "other-oriented" feelings of sympathy and concern for unfortunate others

- Personal Distress – measures "self-oriented" feelings of personal anxiety and unease in tense interpersonal settings

INTERPERSONAL REACTIVITY INDEX

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: A, B, C, D, or E. When you have decided on your answer, fill in the letter next to the item number. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can. Thank you.

ANSWER SCALE:

A	B	C	D	E
DOES NOT DESCRIBE ME WELL				DESCRIBES ME VERY WELL

1. I daydream and fantasize, with some regularity, about things that might happen to me. (FS)
2. I often have tender, concerned feelings for people less fortunate than me. (EC)
3. I sometimes find it difficult to see things from the "other guy's" point of view. (PT) (-)
4. Sometimes I don't feel very sorry for other people when they are having problems. (EC)(-)
5. I really get involved with the feelings of the characters in a novel. (FS)
6. In emergency situations, I feel apprehensive and ill-at-ease. (PD)
7. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. (FS) (-)
8. I try to look at everybody's side of a disagreement before I make a decision. (PT)
9. When I see someone being taken advantage of, I feel kind of protective towards them. (EC)
10. I sometimes feel helpless when I am in the middle of a very emotional situation. (PD)
11. I sometimes try to understand my friends better by imagining how things look from their perspective. (PT)
12. Becoming extremely involved in a good book or movie is somewhat rare for me. (FS)(-)
13. When I see someone get hurt, I tend to remain calm. (PD) (-)
14. Other people's misfortunes do not usually disturb me a great deal. (EC) (-)
15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (PT) (-)
16. After seeing a play or movie, I have felt as though I were one of the characters. (FS)
17. Being in a tense emotional situation scares me. (PD)
18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (EC) (-)
19. I am usually pretty effective in dealing with emergencies. (PD) (-)
20. I am often quite touched by things that I see happen. (EC)
21. I believe that there are two sides to every question and try to look at them both. (PT)

22. I would describe myself as a pretty soft-hearted person. (EC)
23. When I watch a good movie, I can very easily put myself in the place of a leading character. (FS)
24. I tend to lose control during emergencies. (PD)
25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT)
26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. (FS)
27. When I see someone who badly needs help in an emergency, I go to pieces. (PD)
28. Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT)

A3. Transportation (Green & Brock, 2000)

Circle the number under each question that best represents your opinion about the narrative you just read.

1. While I was reading the narrative, I could easily picture the events in it taking place.

1	2	3	4	5	6	7
not at all						very much

2. While I was reading the narrative, activity going on in the room around me was on my mind.

1	2	3	4	5	6	7
not at all						very much

3. I could picture myself in the scene of the events described in the narrative.

1	2	3	4	5	6	7
not at all						very much

4. I was mentally involved in the narrative while reading it.

1	2	3	4	5	6	7
not at all						very much

5. After the narrative ended, I found it easy to put it out of my mind.

1	2	3	4	5	6	7
not at all						very much

6. I wanted to learn how the narrative ended.

1	2	3	4	5	6	7
not at all						very much

7. The narrative affected me emotionally.

1	2	3	4	5	6	7
not at all						very much

8. I found myself thinking of ways the narrative could have turned out differently.

1	2	3	4	5	6	7
not at all						very much

9. I found my mind wandering while reading the narrative.

1	2	3	4	5	6	7
not at all						very much

10. The events in the narrative are relevant to my everyday life.

1	2	3	4	5	6	7
not at all					very much	

11. The events in the narrative have changed my life.

1	2	3	4	5	6	7
not at all					very much	

12. I had a vivid mental image of [character name].

1	2	3	4	5	6	7
not at all					very much	

Notes: Items 2, 5, and 9 are reverse-scored.
Item 12 can be repeated for the number of main characters in the story, substituting a different character name for each item.

A4. Transportation Scale-Short Form (Appel et al., 2015)

Item No.	Item No. TS (original)	Facet	TS-SF English
1	3	Cognitive	I could picture myself in the scene of the events described in the narrative
2	4	Cognitive	I was mentally involved in the narrative while reading it.
3	6	General	I wanted to learn how the narrative ended.
4	7	Emotional	The narrative affected me emotionally.
5	12	Imaginative	While reading the narrative I had a vivid image of [character name].
6	13	Imaginative	While reading the narrative I had a vivid image of [character name].

Note: Items 5 and 6 can be repeated if there is more than 1 main character. "Setting" can also be inserted in to the character name slot for Item 6. Items were presented with a 7-point response scales from 1 (*not at all*) to 7 *(very much*). Item numbers TS correspond to those provided by Green and Brock (2000).

A5. Narrative Engagement (Busselle & Bilandzic, 2009)

Narrative understanding

- NR4*: At points, I had a hard time making sense of what was going on in the program. (-)
- CP4: My understanding of the characters is unclear. (-)
- EC2: I had a hard time recognizing the thread of the story. (-)

Attentional focus

- DS1: I found my mind wandering while [the program was on/reading the narrative]. (-)

- DS2: While [the program was on/reading the narrative] I found myself thinking about other things. (-)
- DS3: I had a hard time keeping my mind on the [program/narrative]. (-)

Narrative presence

- NP4: [During the program/while reading the narrative, my body was in the room, but my mind was inside the world created by the story.
- NP3: The [program/narrative] created a new world, and then that world suddenly disappeared when the program ended.
- NP1: At times [during the program/while reading the narrative], the story world was closer to me than the real world.

Emotional engagement

- EP5: The story affected me emotionally.
- EP3: [During the program/while reading the narrative], when a main character succeeded, I felt happy, and when they suffered in some way, I felt sad.
- SM1: I felt sorry for some of the characters in the [program/narrative].

(-) indicates reverse coded.

*Key to items' original theoretical constructs: CP = cognitive perspective taking; EP = empathy; SM = sympathy; NP = narrative presence; NI = narrative involvement; LT = loss of time; LS = loss of self; EC = ease of cognitive access; DS = distraction; NR = narrative realism.

Note: Items across the four subscales were counterbalanced in their presentation to the participants, so that items from the same factor were not stacked together.

APPENDIX B

Text of the Short Stories Used in Experiment 1 and Experiment 2

Experiment 1

The texts from Experiment 1 are provided in full. The fiction story was developed from *My Oedipus Complex*, written by Frank O'Connor, and was edited down to 2,934 words. The nonfiction story was developed from *Phineas Gage: A Gruesome But True Story About Brain Science*, written by John Fleishman, and was edited down to 2,561 words

My Oedipus Complex. Father was in the army all through the war – the first war, I mean – so, up to the age of five, I never saw much of him, and what I saw did not worry me. Sometimes I woke and there was a big figure in khaki peering down at me in the candlelight. Sometimes in the early morning I heard the slamming of the front door and the clatter of nailed boots down the cobbles of the lane. These were Father's entrances and exits. Like Santa Claus he came and went mysteriously.

In fact, I rather liked his visits, though it was an uncomfortable squeeze between Mother and him when I got into the big bed in the early morning. He smoked, which gave him a pleasant musty smell, and shaved, an operation of astounding interest. Each time he left a trail of souvenirs – model tanks and Gurkha knives with handles made of bullet cases, and German helmets and cap badges and button sticks, and all sorts of military equipment – carefully stowed away in a long box on top of the wardrobe.

The war was the most peaceful period of my life. Life never seemed so simple and clear and full of possibilities as then. I put my feet out from under the clothes – I called them Mrs. Left and Mrs. Right – and invented dramatic situations for them in which they discussed the problems of the day. At least Mrs. Right did; she was very demonstrative, but I hadn't the same control of Mrs. Left, so she mostly contented herself with nodding agreement.

They discussed what Mother and I should do during the day, what Santa Claus should give a fellow for Christmas, and what steps should be taken to brighten the home. There was that little matter of the baby, for instance. Mother and I could never agree about that. Ours was the only house in the terrace without a new baby, and Mother said we couldn't afford one till Father came back from the war because they cost seventeen and six.

After breakfast we went into town, heard Mass at St. Augustine's and said a prayer for Father, and did the shopping. If the afternoon was fine we either went for a walk in the country or a visit to Mother's great friend in the convent, Mother Saint Dominic. Mother had them all praying for Father, and every night, going to bed, I asked God to send him back safe from the war to us. Little, indeed, did I know what I was praying for!

One morning, I got into the big bed, and there, sure enough, was Father in his usual Santa Claus manner, but later, instead of uniform, he put on his best blue suit, and Mother was as pleased as anything. I saw nothing to be pleased about, because, out of uniform, Father

was altogether less interesting, but she only beamed, and explained that our prayers had been answered, and off we went to Mass to thank God for having brought Father safely home.

The irony of it! That very day he began to talk gravely to Mother, who looked anxious. Naturally, I disliked her looking anxious, so I interrupted him.

"Just a moment, Larry!" she said gently. This was only what she said when we had boring visitors, so I attached no importance to it and went on talking.

"Do be quiet, Larry!" she said impatiently. "Don't you hear me talking to Daddy?"

This was the first time I had heard those ominous words, "talking to Daddy."

In the afternoon, at Mother's request, Father took me for a walk. This time we went into town instead of out in the country, and I thought at first, in my usual optimistic way, that it might be an improvement. It was nothing of the sort. Father and I had quite different notions of a walk in town. He had no proper interest in trams, ships, and horses, and the only thing that seemed to divert him was talking to fellows as old as himself. When I wanted to stop he simply went on, dragging me behind him by the hand; when he wanted to stop I had no alternative but to do the same.

At teatime, "talking to Daddy" began again, complicated this time by the fact that he had an evening paper, and every few minutes he put it down and told Mother something new out of it. I felt this was foul play. Man for man, I was prepared to compete with him any time for Mother's attention, but when he had it all made up for him by other people it left me no chance. Several times I tried to change the subject without success.

"You must be quiet while Daddy is reading, Larry," Mother said impatiently.

It was clear that she either genuinely liked talking to Father better than talking to me, or else that he had some terrible hold on her which made her afraid to admit the truth.

Next morning I woke at my usual hour, feeling like a bottle of champagne. I put out my feet and invented a long conversation in which Mrs. Right talked of the trouble she had with her own father till she put him in the Home. I didn't quite know what the Home was but it sounded the right place for Father. My head bursting with stories and schemes, I stumbled in next door, and in the half-darkness scrambled into the big bed.

There was no room at Mother's side so I had to get between her and Father. He was taking up more than his fair share of the bed, and I couldn't get comfortable, so I gave him several kicks that made him grunt and stretch. He made room all right, though. Mother waked and felt for me. I settled back comfortably in the warmth of the bed with my thumb in my mouth.

"Mummy!" I hummed, loudly and contentedly.

"Sssh! dear," she whispered. "Don’t wake Daddy!"

This was a new development, which threatened to be even more serious than "talking to Daddy."

But it was too late. He was awake, or nearly so. He grunted and reached for the matches. Then he stared incredulously at his watch.

"Like a cup of tea, dear?" asked Mother in a meek, hushed voice I had never heard her use before. It sounded almost as though she were afraid.

"Tea?" he exclaimed indignantly. "Do you know what the time is?"

I began to snivel. I couldn’t concentrate, the way that pair went on, and smothering my early-morning schemes was like burying a family from the cradle. Father said nothing, but lit his pipe and sucked it, looking out into the shadows without minding Mother or me. I knew he was mad. Every time I made a remark Mother hushed me irritably. I was mortified. I felt it wasn’t fair; there was even something sinister in it. He got up early and made tea, but though he brought Mother a cup he brought none for me.

That settled it. Either Father or I would have to leave the house. But that night when she was putting me to bed she said gently:

"Larry, I want you to promise me something."

"What is it?"

"Not to come in and disturb poor Daddy in the morning. Promise?"

"Poor Daddy" again! I was becoming suspicious of everything involving that quite impossible man.

"Why?"

"Well, you know, don’t you, that while he was at the war Mummy got the pennies from the post office?"

"From Miss MacCarthy?"

"That’s right. But now, you see, Miss MacCarthy hasn’t any more pennies, so Daddy must go out and find us some. You know what would happen if he couldn’t?"

"No.”

"Well, I think we might have to go out and beg for them like the poor old woman on Fridays. We wouldn't like that, would we?"

"No," I agreed. "We wouldn't."

"So you'll promise not to come in and wake him?"

"Promise."
I meant that. I knew pennies were a serious matter, and I was all against having to go out and beg like the old woman on Fridays. Mother laid out all my toys in a complete ring round the bed so that, whatever way I got out, I was bound to fall over one of them. When I woke I remembered my promise all right. I got up and sat on the floor and played – for hours, it seemed to me. Then I got my chair and looked out the attic window for more hours.

At last I could stand it no longer. I went into the next room. As there was still no room at Mother's side I climbed over her and she woke with a start. "Larry," she whispered, gripping my arm very tightly, "what did you promise?"

"But I did, Mummy," I wailed, caught in the very act. "I was quiet for ever so long."

The injustice of it got me down. Full of spite, I gave Father a kick, which she didn't notice but which made him grunt and open his eyes in alarm.

"What time is it?" he asked in a panic-stricken voice, not looking at Mother but at the door, as if he saw someone there.

"Now, Larry," she said, getting out of bed, "you've wakened Daddy and you must go back."

This time, for all her quiet air, I knew she meant it, and knew that my principal rights and privileges were as good as lost unless I asserted them at once. As she lifted me, I gave a screech, enough to wake the dead, not to mind Father.

He groaned. "That damn child! Doesn't he ever sleep?"

"It's only a habit, dear," she said quietly, though I could see she was vexed.

"Well, it's time he got out of it," shouted Father, beginning to heave in the bed. He suddenly gathered all the bedclothes about him, turned to the wall, and then looked back over his shoulder with nothing showing only two small, spiteful, dark eyes. The man looked very wicked. To open the bedroom door, Mother had to let me down, and I broke free and dashed for the farthest corner, screeching.

Father sat bolt upright in bed. "Shut up, you little puppy," he said in a choking voice.

I was so astonished that I stopped screeching. Never, never had anyone spoken to me in that tone before. I looked at him incredulously and saw his face convulsed with rage. It was only then that I fully realized how God had codded me, listening to my prayers for the safe return of this monster.

"Shut up, you!" I bawled, beside myself.

At this he lost his patience and let fly at me. He did it with the lack of conviction you'd expect of a man under Mother's horrified eyes, and it ended up as a mere tap, but the sheer indignity of being struck at all by a stranger, a total stranger who had cajoled his way back from the war into our big bed made me completely dotty. I shrieked and shrieked, and danced in my bare feet, and Father, looking awkward and hairy in nothing but a short gray army shirt, glared down at me like a mountain out for murder. I think it must have been then that I realized he was jealous too.

From that morning out my life was a hell. Father and I were enemies, open and avowed. We conducted a series of skirmishes against one another, he trying to steal my time with Mother and I his. When she was sitting on my bed, telling me a story, he took to looking for some pair of old boots which he alleged he had left behind him at the beginning of the war. While he talked to Mother I played loudly with my toys.

What made it worse was that I couldn't grasp his method or see what attraction he had for Mother. In every possible way he was less winning than I. He had a common accent and made noises at his tea. I thought for a while that it might be the newspapers she was interested in, so I made up bits of news of my own to read to her. Then I thought it might be the smoking, and took his pipes and went round the house dribbling into them till he caught me. I even made noises at my tea, but Mother only told me I was disgusting.

It all seemed to hinge round that unhealthy habit of sleeping together, so I made a point of dropping into their bedroom and nosing round, talking to myself, so that they wouldn't know I was watching them, but they were never up to anything that I could see. In the end it beat me. It seemed to depend on being grown-up and giving people rings, and I realized I'd have to wait. But at the same time I wanted him to see that I was only waiting, not giving up the fight.

One evening when he was being particularly obnoxious, chattering away well above my head, I let him have it.

"Mummy," I said, "do you know what I'm going to do when I grow up?"

"No, dear," she replied. "What?"

"I'm going to marry you," I said quietly.

Father gave a great guffaw. But Mother, in spite of everything, was pleased. I felt she was probably relieved to know that one day Father's hold on her would be broken.

"Won’t that be nice?" she said with a smile.

"It’ll be very nice," I said confidently. "Because we’re going to have lots and lots of babies."

"That’s right, dear," she said placidly. "I think we’ll have one soon, and then you’ll have plenty of company."

It didn’t turn out like that, though. To begin with, she was very preoccupied – I supposed about where she would get the seventeen and six – and though Father took to staying out late in the evenings it did me no particular good. She stopped taking me for walks, became as touchy as blazes, and smacked me for nothing at all. Sometimes I wished I’d never mentioned the confounded baby. I seemed to have a genius for bringing calamity on myself.

And calamity it was! Sonny arrived in the most appalling hullabaloo – even that much he couldn’t do without a fuss – and from the first moment I disliked him. He was a difficult child – so far as I was concerned he was always difficult – and demanded far too much attention. As company he was worse than useless. He slept all day, and I had to go round the house on tiptoe to avoid waking him. It wasn’t any longer a question of not waking Father. I couldn’t understand why the child wouldn’t sleep at the proper time, so whenever Mother’s back was turned I woke him.

One evening, when Father was coming in from work, I was playing trains in the front garden. I let on not to notice him, pretended to be talking to myself, and said in a loud voice: "If another bloody baby comes into this house, I’m going out."

Father stopped dead and looked at me over his shoulder. "What’s that you said?" he asked sternly.

""I was only talking to myself," I replied, trying to conceal my panic. "It’s private."

He turned and went in without a word.

I intended it as a solemn warning, but its effect was quite different. Father started being quite nice to me. I could understand that, of course. Mother was quite sickening about Sonny. Even at mealtimes she’d get up and gawk at him in the cradle with an idiotic smile, and tell Father to do the same. He was always polite about it, but he looked so puzzled you could see he didn’t know what she was talking about. He complained of the way Sonny cried at night, but she only got cross and said that Sonny never cried except when there was something up with him – which was a flaming lie, because Sonny never had anything up with him, and only cried for attention. It was really painful to see how simpleminded she was.

Father wasn't attractive, but he had a fine intelligence. He saw through Sonny, and now he knew that I saw through him as well. One night I woke with a start. There was someone beside me in the bed. For one wild moment I felt sure it must be Mother, having come to her senses and left Father for good, but then I heard Sonny in convulsions in the next room.

It was Father. He was lying beside me, wide-awake, breathing hard and apparently as mad as hell. After a while it came to me what he was mad about. It was his turn now. After turning me out of the big bed, he had been turned out himself. Mother had no consideration now for anyone but that poisonous pup, Sonny.

I couldn't help feeling sorry for Father. I had been through it all myself, and even at that age I was magnanimous.

He wasn't exactly responsive. "Aren't you asleep either?" he snarled.

"Ah, come on and put your arm around us, can't you?" I said, and he did, in a sort of way. Gingerly, I suppose, is how you'd describe it. He was very bony but better than nothing.

At Christmas he went out of his way to buy me a really nice model railway.

Phineas Gage. The most unlucky/lucky moment in the life of Phineas Gage is only a minute or two away. It's almost four-thirty in the afternoon on September 13, 1848. Phineas is the foreman of a track construction gang that is in the process of blasting a railroad right-of-way through granite bedrock near the small town of Cavendish, Vermont. Phineas is twenty-six years old, unmarried, and five feet, six inches tall, short for our time but about average for his. He is good with his hands and good with his men, "possessing an iron will as well as an iron frame," according to his doctor. In a moment, Phineas will have a horrible accident.

It will kill him, but it will take another eleven years, six months, and nineteen days to do so. In the short run, Phineas will make a full recovery, or so it will seem to those who didn't know him before. Old friends and family know the truth. Phineas will never be his old self again. His character will change. The ways in which he deals with others, conducts himself, and makes plans will all change. Long after the accident, his doctor will sum up his case for a medical journal. "Gage," his doctor will write, "was no longer Gage." Phineas Gage's accident will make him world famous, but fame will do him little good. Yet for many others—psychologists, medical researchers, doctors, and especially those who suffer brain injuries—Phineas Gage will become someone worth knowing.

That's why we know so much about Phineas. It's been 150 years since his accident, yet we are still learning more about him. There's also a lot about Phineas we don't know and probably never will. The biggest question is the simplest one and the hardest to answer: Was Phineas lucky or unlucky? Once the reader hears his story, they can decide for

themselves. But right now, Phineas is working on the railroad and his time has nearly come.

Building a railroad in 1848 is muscle work. There are no bull dozers or power shovels to open a way through Vermont's Green Mountains for the Rutland & Burlington Railroad. Phineas' men work with picks, shovels, and rock drills. Phineas' special skill is blasting. With well-placed charges of black gunpowder, he shatters rock. To set those charges, he carries the special tool of the blasting trade, his "tamping iron."

Some people confuse a tamping iron with a crowbar, but they are different tools for different jobs. A crowbar is for lifting up or prying apart something heavy, whereas a tamping iron is for the delicate job of setting explosives. Phineas' tamping iron was not an average tamping iron either. Phineas had his tamping iron made to order by a neighborhood blacksmith, resulting in a tapered iron rod three feet, seven inches long and weighing thirteen and a half pounds. It looks like an iron spear. At the base, it's fat and round, an inch and three quarters in diameter. The fat end is for tamping—packing down—loose powder. The other end comes to a sharp, narrow point and is for poking holes through the gunpowder to set the fuse. Phineas' tamping iron was very smooth to the touch, smooth from the blacksmith's forge as well as from constant use.

His task is to blast the solid rock into pieces small enough for his crew to dig loose with hand tools and haul away in ox carts. The first step is to drill a hole in the bedrock at exactly the right angle and depth, or the explosion will be wasted. All day, Phineas must keep an eye on his diggers to make sure they keep up. All the time between, Phineas and his assistant are working with touchy explosives.

They follow a strict routine. His assistant "charges" each new hole by filling the bottom with coarse-grained gunpowder. Phineas uses the narrow end of his iron to carefully press the rope like fuse down into the powder. The assistant then fills up the rest of the hole with loose sand to act as a plug. Phineas will tamp the sand tight to bottle up the explosion, channeling the blast downward into the rock to shatter it.

While his assistant pours the sand, Phineas flips his tamping iron around from the pointy end to the round end for tamping. Black powder is ticklish stuff. When it's damp, nothing will set it off. When it's too dry or mixed in the wrong formula, almost anything can set it off, without warning. But Phineas and his assistant have done this a thousand times—pour the powder, set the fuse, pour the sand, tamp the sand plug, shout a warning, light the fuse, and run like mad.

But something goes wrong this time. The sand is never poured down the hole; the black powder and fuse sit exposed at the bottom. Does his assistant forget, or does Phineas forget to look? Witnesses disagree. A few yards behind Phineas, a group of his men are using a hand-cranked derrick crane to hoist a large piece of rock. Some of the men remember seeing Phineas standing over the blast hole, leaning lightly on the tamping iron. Others say Phineas was sitting on a rock ledge above the hole, holding the iron loosely between his knees.

There is no argument about what happens next. Something or someone distracts Phineas. Does he hear his name called? Does he spot someone goofing off? The reason didn't really matter though because Phineas turned his head. The fat end of his tamping iron slips down into the hole and strikes the granite. A spark flies onto the exposed blasting powder.

Blam! The drill hole acts as a gun barrel. Instead of a bullet, it fires Phineas' rod straight upward. The iron shrieks through the air and comes down with a loud clang about thirty feet away.

The pointed end of the rod enters under his left cheekbone, passes behind his left eye, through the front of his brain, and out the middle of his forehead just above the hairline. It takes a fraction of a fraction of a second for the iron rod to pass from cheekbone to forehead, through and through.

Amazingly, Phineas is still alive. The iron throws him flat on his back, but as his men come running through the gunpowder smoke, he sits up. A minute later, he speaks. Blood is pouring down his face from his forehead, but Phineas is talking about the explosion. His men insist on carrying him to an ox cart for the short ride into town. They gently lift him into the back of the cart so he can sit up with his legs out before him on the floor. An Irish workman grabs a horse and races ahead for the doctor while the ox cart ambulance rumbles slowly down the half-mile to Cavendish. Phineas' excited men crowd alongside, walking next to their injured boss. Still acting as a foreman, Phineas calls out for his time book and makes an entry as he rolls toward town.

Something terrible has happened, yet Phineas gets down from the cart without help. He climbs the steps of the Cavendish hotel, where he has been living, and takes a seat on the porch beside his landlord, Joseph Adams. A few minutes earlier, Adams had seen the Irishman ride past shouting for Dr. Harlow, the town physician. Dr. Harlow was not to be found, so the rider was sent on to the next village to fetch Dr. Williams. Now Phineas takes a neighborly seat on the porch and tells his landlord what happened to him.

That's how Dr. Edward Williams finds Phineas nearly thirty minutes after the accident. Dr. Williams pulls up in his buggy at the hotel porch, and there is Phineas, talking away. Friends, workmates, and the curious, crowd around as Dr. Williams climbs down from his carriage.

"Well, here's work enough for you, Doctor," Phineas says to him quite cheerfully. Dr. Williams examines Phineas' head. He can't believe that this man is still alive. His skull is cracked open, as if something has popped out from the inside. Accident victims are often too shaken to know what happened, so Dr. Williams turns to Phineas' workmen for the story, but Phineas insists on speaking for himself. He tells Dr. Williams that the iron went right through his head.

Dr. Williams does not believe him. "I thought he was deceived," Dr. Williams wrote in his notes. "I asked him where the bar entered, and he pointed to the wound on his cheek, which I had not before discovered. This was a slit running from the angle of the jaw forward about one and a half inch. It was very much stretched laterally, and was discolored by powder and iron rust, at least appeared so. Mr. Gage persisted in saying that the bar went through his head. An Irishman standing by said, 'Sure it was so, sir, for the bar is lying in the road below, all blood and brains.'"

An hour after the accident, the town's regular physician, Dr. John Martyn Harlow, finally arrives at the hotel. The two doctors confer, but Dr. Harlow takes over the case. Phineas is a gruesome sight. Bleeding freely from his forehead and inside his mouth, Phineas looks to Dr. Harlow like a wounded man just carried in from a battlefield. Yet Phineas is alert, uncomplaining, and still telling anyone who'll listen about the accident.

Dr. Harlow wants Phineas to come in off the porch so he can treat his wound. Phineas gets up and, leaning only lightly on Dr. Harlow's arm, climbs up a long flight of stairs to his room. He lies down on his own bed so Dr. Harlow can shave his head and examine the wound more closely. What the doctor sees is terrible. Something has erupted through the top of Phineas' head, shattering the skull in its path and opening the brain to plain sight.

Dr. Harlow does what he can. He cleans the skin around the hole, extracts the small fragments of bone, and gently presses the larger pieces of skull back in place. He looks inside Phineas' mouth and sees the hole where the iron passed upward through the roof of his mouth. Dr. Harlow decides to leave the hole open so the wound can drain. Then Dr. Harlow "dresses" the wound, pulling the loose skin back into position and taping it in place with adhesive strips. He puts a compress bandage directly over the wound and pulls Phineas' nightcap down tightly over it. Finally, he winds a roller bandage around his forehead to hold all the bandages securely. Only then does he notice Phineas' hands and forearms, which are black with powder burns. Dr. Harlow dresses the burnt skin and has Phineas put to bed with his head elevated. He gives strict orders that his patient is to remain in that position.

Phineas should have been dead long before this. A thirteen-pound iron rod through the head should kill a person instantly. Surviving that, he should have died of shock soon after reaching Cavendish. He's lost a lot of blood, yet he remains awake and talkative. Even surviving the loss of blood, Phineas should have died of brain swelling. Any hard blow to the body causes injured tissue to swell. The brain is soft, and the skull is hard. A hard blow to the head can rattle the brain around inside like a BB in a tin can. The ratline bruises the brain, and bruised tissue swells. The brain swells, but the skull stays the same size; a swollen brain can jam itself so tightly it will cut off its own blood supply. This swelling can choke off oxygen to parts of the brain long enough to cause permanent damage. It can also cause death.

Here Phineas has a stroke of luck. His is an "open brain" injury. The hole on top of his head gives his battered brain swelling room. The bad news is that his brain is open to

infection. At first, though, he does remarkably well. The bleeding from his forehead slows and then stops within twenty-four hours. He remains cheerful and tells Dr. Harlow that he "does not care to see his friends as he shall be at work in a few days." The morning after the accident, however, he is glad to see his mother and uncle when they arrive from New Hampshire. Two days after the accident, he takes a turn for the worse. He develops a fever and begins to have delirious spells. His wound is leaking a foul-smelling liquid, a sure sign of infection. His death seems just a matter of time now.

But instead, the patient gains strength. Too much strength, in his doctor's opinion. Dr. Harlow is called out of town for a few days, and when he comes back he finds Phineas out of his sickbed. His head still heavily bandaged, Phineas is roaming about Cavendish in the rain with no coat and thin shoes. He is eating unwisely, refusing nursing advice, and ignoring doctor's orders.

Phineas says he wants to go home to his mother's house in Lebanon, New Hampshire, twenty miles away. He intends to walk. According to the best medical theories of his day, Dr. Harlow diagnoses an imbalance of bodily "humors." This theory, dating back to the ancient Greeks, declares that health is maintained by a balance of four liquids, or humors, in the body—blood, phlegm, yellow bile, and black bile. To bring them into balance, Dr. Harlow prescribes two powerful drugs—an "emetic" to make Phineas throw up and a "purgative," a powerful laxative, to evacuate his bowels. Phineas is knocked flat by the medicines and spends the next two weeks in bed, where Dr. Harlow keeps him on a "low," or bland, diet. His humors may or may not be in balance, but Phineas is resting quietly at last.

Ten weeks after the accident, Dr. Harlow declares Phineas fully recovered from his wounds. He puts Phineas in a closed carriage and sends him home to his mother in New Hampshire. Phineas is very weak, but he can walk short distances. He can count, feed and dress himself, and sing. He can speak clearly and make sense of what he hears. Yet there is something odd about the "recovered" Phineas.

Just before he leaves Cavendish, Dr. Harlow gives Phineas a little test. The doctor offers Phineas $1,000 for the pocketful of pebbles that Phineas has collected walking along the Black River near town. Dr. Harlow knows that Phineas can add and subtract, yet Phineas angrily refuses the deal. Dr. Harlow tells himself that a man who was so badly hurt is going to need time to regain his full powers.

In the spring, Phineas goes back to Cavendish, carrying his tamping iron. He never goes anywhere without it these days. Phineas has come for a final examination by Dr. Harlow and to reclaim his old job on the railroad. His left eye looks intact, but the vision has gradually faded away. Phineas has a huge scar on his forehead and a small scar under his cheekbone, but otherwise he is physically healed. Yet Dr. Harlow has private doubts about Phineas' mental state. Phineas is just not his old self.

Experiment 2

In Experiment 2, the text length of both stories was extended. In the case of the fiction story, this meant including the entire short story without edits, totaling 4,521 words. For the nonfiction story, edits were still applied to maintain the narrative nonfiction content and voice, since the goal was to present readers with text as narratively comparable as possible despite the differences in genre and content matter. The nonfiction text in Experiment 2 totaled 4,047 words.

My Oedipus Complex. Father was in the army all through the war – the first war, I mean – so, up to the age of five, I never saw much of him, and what I saw did not worry me. Sometimes I woke and there was a big figure in khaki peering down at me in the candlelight. Sometimes in the early morning I heard the slamming of the front door and the clatter of nailed boots down the cobbles of the lane. These were Father's entrances and exits. Like Santa Claus he came and went mysteriously.

In fact, I rather liked his visits, though it was an uncomfortable squeeze between Mother and him when I got into the big bed in the early morning. He smoked, which gave him a pleasant musty smell, and shaved, an operation of astounding interest. Each time he left a trail of souvenirs – model tanks and Gurkha knives with handles made of bullet cases, and German helmets and cap badges and button sticks, and all sorts of military equipment – carefully stowed away in a long box on top of the wardrobe, in case they ever came in handy. There was a bit of the magpie about Father; he expected everything to come in handy. When his back was turned, Mother let me get a chair and rummage through his treasures. She didn't seem to think so highly of them as he did.

The war was the most peaceful period of my life. The window of my attic faced southeast. My mother had curtained it, but that had small effect. I always woke with the first light and, with all the responsibilities of the previous day melted, feeling myself rather like the sun, ready to illumine and rejoice. Life never seemed so simple and clear and full of possibilities as then. I put my feet out from under the clothes – I called them Mrs. Left and Mrs. Right – and invented dramatic situations for them in which they discussed the problems of the day. At least Mrs. Right did; she was very demonstrative, but I hadn't the same control of Mrs. Left, so she mostly contented herself with nodding agreement.

They discussed what Mother and I should do during the day, what Santa Claus should give a fellow for Christmas, and what steps should be taken to brighten the home. There was that little matter of the baby, for instance. Mother and I could never agree about that. Ours was the only house in the terrace without a new baby, and Mother said we couldn't afford one till Father came back from the war because they cost seventeen and six.

That showed how simple she was. The Geneys up the road had a baby, and everyone knew they couldn't afford seventeen and six. It was probably a cheap baby, and Mother wanted something really good, but I felt she was too exclusive. The Geneys' baby would have done us fine.

Having settled my plans for the day, I got up, put a chair under the attic window, and lifted the frame high enough to stick out my head. The window overlooked the front gardens of the terrace behind ours, and beyond these it looked over a deep valley to the tall, red brick houses terraced up the opposite hillside, which were all still in shadow, while those at our side of the valley were all lit up, though with long strange shadows that made them seem unfamiliar; rigid and painted.

After that I went into Mother's room and climbed into the big bed. She woke and I began to tell her of my schemes. By this time, though I never seemed to have noticed it, I was petrified in my nightshirt, and I thawed as I talked until, the last frost melted, I fell asleep beside her and woke again only when I heard her below in the kitchen, making the breakfast.

After breakfast we went into town; heard Mass at St. Augustine's and said a prayer for Father, and did the shopping. If the afternoon was fine we either went for a walk in the country or a visit to Mother's great friend in the convent, Mother Saint Dominic. Mother had them all praying for Father, and every night, going to bed, I asked God to send him back safe from the war to us. Little, indeed, did I know what I was praying for!

One morning, I got into the big bed, and there, sure enough, was Father in his usual Santa Claus manner, but later, instead of uniform, he put on his best blue suit, and Mother was as pleased as anything. I saw nothing to be pleased about, because, out of uniform, Father was altogether less interesting, but she only beamed, and explained that our prayers had been answered, and off we went to Mass to thank God for having brought Father safely home.

The irony of it! That very day when he came in to dinner he took off his boots and put on his slippers, donned the dirty old cap he wore about the house to save him from colds, crossed his legs, and began to talk gravely to Mother, who looked anxious. Naturally, I disliked her looking anxious, because it destroyed her good looks, so I interrupted him.

"Just a moment, Larry!" she said gently. This was only what she said when we had boring visitors, so I attached no importance to it and went on talking.

"Do be quiet, Larry!" she said impatiently. "Don't you hear me talking to Daddy?"

This was the first time I had heard those ominous words, "talking to Daddy," and I couldn't help feeling that if this was how God answered prayers, he couldn't listen to them very attentively.

"Why are you talking to Daddy?" I asked with as great a show of indifference as I could muster.

"Because Daddy and I have business to discuss. Now, don't interrupt again!"

In the afternoon, at Mother's request, Father took me for a walk. This time we went into town instead of out in the country, and I thought at first, in my usual optimistic way, that it might be an improvement. It was nothing of the sort. Father and I had quite different notions of a walk in town. He had no proper interest in trams, ships, and horses, and the only thing that seemed to divert him was talking to fellows as old as himself. When I wanted to stop he simply went on, dragging me behind him by the hand; when he wanted to stop I had no alternative but to do the same.

I noticed that it seemed to be a sign that he wanted to stop for a long time whenever he leaned against a wall. The second time I saw him do it I got wild. He seemed to be settling himself forever. I pulled him by the coat and trousers, but, unlike Mother who, if you were too persistent, got into a wax and said: "Larry, if you don't behave yourself, I'll give you a good slap," Father had an extraordinary capacity for amiable inattention. I sized him up and wondered would I cry, but he seemed to be too remote to be annoyed even by that. Really, it was like going for a walk with a mountain! He either ignored the wrenching and pummeling entirely, or else glanced down with a grin of amusement from his peak. I had never met anyone so absorbed in himself as he seemed.

At teatime, "talking to Daddy" began again, complicated this time by the fact that he had an evening paper, and every few minutes he put it down and told Mother something new out of it. I felt this was foul play. Man for man, I was prepared to compete with him any time for Mother's attention, but when he had it all made up for him by other people it left me no chance. Several times I tried to change the subject without success.

"You must be quiet while Daddy is reading, Larry," Mother said impatiently.

It was clear that she either genuinely liked talking to Father better than talking to me, or else that he had some terrible hold on her which made her afraid to admit the truth.

"Mummy," I said that night when she was tucking me up, "do you think if I prayed hard God would send Daddy back to the war?"

She seemed to think about that for a moment.

"No, dear," she said with a smile. "I don't think He would."

"Why wouldn't He, Mummy?"

"Because there isn't a war any longer, dear."

"But, Mummy, couldn't God make another war, if He liked?"

"He wouldn't like to, dear. It's not God who makes wars, but bad people.

"Oh!" I said. I was disappointed about that. I began to think that God wasn't quite what He was cracked up to be.

Next morning I woke at my usual hour, feeling like a bottle of champagne. I put out my feet and invented a long conversation in which Mrs. Right talked of the trouble she had with her own father till she put him in the Home. I didn't quite know what the Home was but it sounded the right place for Father. Then I got my chair and stuck my head out of the attic window. Dawn was just breaking, with a guilty air that made me feel I had caught it in the act. My head bursting with stories and schemes, I stumbled in next door, and in the half-darkness scrambled into the big bed.

There was no room at Mother's side so I had to get between her and Father. For the time being I had forgotten about him, and for several minutes I sat bolt upright, racking my brains to know what I could do with him. He was taking up more than his fair share of the bed, and I couldn't get comfortable, so I gave him several kicks that made him grunt and stretch. He made room all right, though. Mother waked and felt for me. I settled back comfortably in the warmth of the bed with my thumb in my mouth.

"Mummy!" I hummed, loudly and contentedly.

"Sssh! dear," she whispered. "Don't wake Daddy!"
This was a new development, which threatened to be even more serious than "talking to Daddy." Life without my early-morning conferences was unthinkable.

"Why?" I asked severely.

"Because poor Daddy is tired." This seemed to me a quite inadequate reason, and I was sickened by the sentimentality of her "poor Daddy." I never liked that sort of gush; it always struck me as insincere.

"Oh!" I said lightly. Then in my most winning tone: "Do you know where I want to go with you today, Mummy?"

"No, dear," she sighed.

"I want to go down the Glen and fish for thornybacks with my new net, and then I want to go out to the Fox and Hounds, and –"

"Don't-wake-Daddy!" she hissed angrily, clapping her hand across my mouth.

But it was too late. He was awake, or nearly so. He grunted and reached for the matches. Then he stared incredulously at his watch.

"Like a cup of tea, dear?" asked Mother in a meek, hushed voice I had never heard her use before. It sounded almost as though she were afraid.

"Tea?" he exclaimed indignantly. "Do you know what the time is?"

"And after that I want to go up the Rathcooney Road," I said loudly, afraid I'd forget something in all those interruptions.

"Go to sleep at once, Larry!" she said sharply.

I began to snivel. I couldn't concentrate, the way that pair went on, and smothering my early-morning schemes was like burying a family from the cradle. Father said nothing, but lit his pipe and sucked it, looking out into the shadows without minding Mother or me. I knew he was mad. Every time I made a remark Mother hushed me irritably. I was mortified. I felt it wasn't fair; there was even something sinister in it. Every time I had pointed out to her the waste of making two beds when we could both sleep in one, she had told me it was healthier like that, and now here was this man, this stranger, sleeping with her without the least regard for her health! He got up early and made tea, but though he brought Mother a cup he brought none for me.

"Mummy," I shouted, "I want a cup of tea, too."

"Yes, dear," she said patiently. "You can drink from Mummy's saucer."

That settled it. Either Father or I would have to leave the house. I didn't want to drink from Mother's saucer; I wanted to be treated as an equal in my own home, so, just to spite her, I drank it all and left none for her. She took that quietly, too. But that night when she was putting me to bed she said gently:

"Larry, I want you to promise me something."

"What is it?" I asked.

"Not to come in and disturb poor Daddy in the morning. Promise?"

"Poor Daddy" again! I was becoming suspicious of everything involving that quite impossible man.

"Why?" I asked.

"Because poor Daddy is worried and tired and he doesn't sleep well."

"Why doesn't he, Mummy?"

"Well, you know, don't you, that while he was at the war Mummy got the pennies from the post office?"

"From Miss MacCarthy?"

"That's right. But now, you see, Miss MacCarthy hasn't any more pennies, so Daddy must go out and find us some. You know what would happen if he couldn't?"

"No," I said, "tell us."

"Well, I think we might have to go out and beg for them like the poor old woman on Fridays. We wouldn't like that, would we?"

"No," I agreed. "We wouldn't."

"So you'll promise not to come in and wake him?"

"Promise."

Mind you, I meant that. I knew pennies were a serious matter, and I was all against having to go out and beg like the old woman on Fridays. Mother laid out all my toys in a complete ring round the bed so that, whatever way I got out, I was bound to fall over one of them. When I woke I remembered my promise all right. I got up and sat on the floor and played – for hours, it seemed to me. Then I got my chair and looked out the attic window for more hours. I wished it was time for Father to wake; I wished someone would make me a cup of tea. I didn't feel in the least like the sun; instead, I was bored and so very, very cold! I simply longed for the warmth and depth of the big feather bed. At last I could stand it no longer.

I went into the next room. As there was still no room at Mother's side I climbed over her and she woke with a start.

"Larry," she whispered, gripping my arm very tightly, "what did you promise?"

"But I did, Mummy," I wailed, caught in the very act. "I was quiet for ever so long."

"Oh, dear, and you're perished!" she said sadly, feeling me all over. "Now, if I let you stay will you promise not to talk?"

"But I want to talk, Mummy," I wailed.

"That has nothing to do with it," she said with a firmness that was new to me. "Daddy wants to sleep. Now, do you understand that?"

I understood it only too well. I wanted to talk, he wanted to sleep – whose house was it, anyway?
"Mummy," I said with equal firmness, "I think it would be healthier for Daddy to sleep in his own bed."

That seemed to stagger her, because she said nothing for a while.

"Now, once for all," she went on, "you're to be perfectly quiet or go back to your own bed. Which is it to be?"

The injustice of it got me down. I had convicted her out of her own mouth of inconsistency and unreasonableness, and she hadn't even attempted to reply. Full of spite, I gave Father a kick, which she didn't notice but which made him grunt and open his eyes in alarm.

"What time is it?" he asked in a panic-stricken voice, not looking at Mother but at the door, as if he saw someone there.

"It's early yet," she replied soothingly. "It's only the child. Go to sleep again.... Now, Larry," she added, getting out of bed, "you've wakened Daddy and you must go back."

This time, for all her quiet air, I knew she meant it, and knew that my principal rights and privileges were as good as lost unless I asserted them at once. As she lifted me, I gave a screech, enough to wake the dead, not to mind Father.

He groaned. "That damn child! Doesn't he ever sleep?"

"It's only a habit, dear," she said quietly, though I could see she was vexed.

"Well, it's time he got out of it," shouted Father, beginning to heave in the bed. He suddenly gathered all the bedclothes about him, turned to the wall, and then looked back over his shoulder with nothing showing only two small, spiteful, dark eyes. The man looked very wicked. To open the bedroom door, Mother had to let me down, and I broke free and dashed for the farthest corner, screeching.

Father sat bolt upright in bed. "Shut up, you little puppy," he said in a choking voice.
I was so astonished that I stopped screeching. Never, never had anyone spoken to me in that tone before. I looked at him incredulously and saw his face convulsed with rage. It was only then that I fully realized how God had codded me, listening to my prayers for the safe return of this monster.

"Shut up, you!" I bawled, beside myself.

"What's that you said?" shouted Father, making a wild leap out of the bed.

"Mick, Mick!" cried Mother. "Don't you see the child isn't used to you?"

"I see he's better fed than taught," snarled Father, waving his arms wildly. "He wants his bottom smacked."

All his previous shouting was as nothing to these obscene words referring to my person. They really made my blood boil.

"Smack your own!" I screamed hysterically. "Smack your own! Shut up! Shut up!"

At this he lost his patience and let fly at me. He did it with the lack of conviction you'd expect of a man under Mother's horrified eyes, and it ended up as a mere tap, but the sheer indignity of being struck at all by a stranger, a total stranger who had cajoled his way back from the war into our big bed as a result of my innocent intercession, made me completely dotty. I shrieked and shrieked, and danced in my bare feet, and Father, looking awkward and hairy in nothing but a short gray army shirt, glared down at me like a mountain out for murder. I think it must have been then that I realized he was jealous too. And there stood Mother in her nightdress, looking as if her heart was broken between us. I hoped she felt as she looked. It seemed to me that she deserved it all.

From that morning out my life was a hell. Father and I were enemies, open and avowed. We conducted a series of skirmishes against one another, he trying to steal my time with Mother and I his. When she was sitting on my bed, telling me a story, he took to looking for some pair of old boots which he alleged he had left behind him at the beginning of the war. While he talked to Mother I played loudly with my toys to show my total lack of concern.

He created a terrible scene one evening when he came in from work and found me at his box, playing with his regimental badges, Gurkha knives and button sticks. Mother got up and took the box from me.
"You mustn't play with Daddy's toys unless he lets you, Larry," she said severely. "Daddy doesn't play with yours."

For some reason Father looked at her as if she had struck him and then turned away with a scowl.

"Those are not toys," he growled, taking down the box again to see had I lifted anything. "Some of those curios are very rare and valuable."

But as time went on I saw more and more how he managed to alienate Mother and me. What made it worse was that I couldn't grasp his method or see what attraction he had for Mother. In every possible way he was less winning than I. He had a common accent and made noises at his tea. I thought for a while that it might be the newspapers she was interested in, so I made up bits of news of my own to read to her. Then I thought it might be the smoking, which I personally thought attractive, and took his pipes and went round the house dribbling into them till he caught me. I even made noises at my tea, but Mother only told me I was disgusting.

It all seemed to hinge round that unhealthy habit of sleeping together, so I made a point of dropping into their bedroom and nosing round, talking to myself, so that they wouldn't know I was watching them, but they were never up to anything that I could see. In the end it beat me. It seemed to depend on being grown-up and giving people rings, and I realized I'd have to wait. But at the same time I wanted him to see that I was only

waiting, not giving up the fight. One evening when he was being particularly obnoxious, chattering away well above my head, I let him have it.

"Mummy," I said, "do you know what I'm going to do when I grow up?"

"No, dear," she replied. "What?"

"I'm going to marry you," I said quietly.

Father gave a great guffaw out of him, but he didn't take me in. I knew it must only be pretense.

And Mother, in spite of everything, was pleased. I felt she was probably relieved to know that one day Father's hold on her would be broken.

"Won't that be nice?" she said with a smile.

"It'll be very nice," I said confidently. "Because we're going to have lots and lots of babies."

"That's right, dear," she said placidly. "I think we'll have one soon, and then you'll have plenty of company."

I was no end pleased about that because it showed that in spite of the way she gave in to Father she still considered my wishes. Besides, it would put the Geneys in their place. It didn't turn out like that, though. To begin with, she was very preoccupied – I supposed about where she would get the seventeen and six – and though Father took to staying out late in the evenings it did me no particular good. She stopped taking me for walks, became as touchy as blazes, and smacked me for nothing at all. Sometimes I wished I'd never mentioned the confounded baby – I seemed to have a genius for bringing calamity on myself.

And calamity it was! Sonny arrived in the most appalling hulla-baloo – even that much he couldn't do without a fuss – and from the first moment I disliked him. He was a difficult child – so far as I was concerned he was always difficult – and demanded far too much attention. Mother was simply silly about him, and couldn't see when he was only showing off. As company he was worse than useless. He slept all day, and I had to go round the house on tiptoe to avoid waking him. It wasn't any longer a question of not waking Father. The slogan now was "Don't-wake-Sonny!" I couldn't understand why the child wouldn't sleep at the proper time, so whenever Mother's back was turned I woke him. Sometimes to keep him awake I pinched him as well. Mother caught me at it one day and gave me a most unmerciful flaking.

One evening, when Father was coming in from work, I was playing trains in the front garden. I let on not to notice him; instead, I pretended to be talking to myself, and said in a loud voice: "If another bloody baby comes into this house, I'm going out."

Father stopped dead and looked at me over his shoulder. "What's that you said?" he asked sternly.

"I was only talking to myself," I replied, trying to conceal my panic. "It's private."

He turned and went in without a word.

Mind you, I intended it as a solemn warning, but its effect was quite different. Father started being quite nice to me. I could understand that, of course. Mother was quite sickening about Sonny. Even at mealtimes she'd get up and gawk at him in the cradle with an idiotic smile, and tell Father to do the same. He was always polite about it, but he looked so puzzled you could see he didn't know what she was talking about. He complained of the way Sonny cried at night, but she only got cross and said that Sonny never cried except when there was something up with him – which was a flaming lie, because Sonny never had anything up with him, and only cried for attention. It was really painful to see how simpleminded she was.

Father wasn't attractive, but he had a fine intelligence. He saw through Sonny, and now he knew that I saw through him as well. One night I woke with a start. There was someone beside me in the bed. For one wild moment I felt sure it must be Mother, having come to her senses and left Father for good, but then I heard Sonny in convulsions in the next room, and Mother saying: "There! There! There!" and I knew it wasn't she. It was Father. He was lying beside me, wide-awake, breathing hard and apparently as mad as hell. After a while it came to me what he was mad about. It was his turn now. After turning me out of the big bed, he had been turned out himself. Mother had no consideration now for anyone but that poisonous pup, Sonny.

I couldn't help feeling sorry for Father. I had been through it all myself, and even at that age I was magnanimous. I began to stroke him down and say: "There! There!"

He wasn't exactly responsive. "Aren't you asleep either?" he snarled.

"Ah, come on and put your arm around us, can't you?" I said, and he did, in a sort of way. Gingerly, I suppose, is how you'd describe it. He was very bony but better than nothing.

At Christmas he went out of his way to buy me a really nice model railway.

Phineas Gage. The most unlucky/lucky moment in the life of Phineas Gage is only a minute or two away. It's almost four-thirty in the afternoon on September 13, 1848. Phineas is the foreman of a track construction gang that is in the process of blasting a railroad right-of-way through granite bedrock near the small town of Cavendish, Vermont. Phineas is twenty-six years old, unmarried, and five feet, six inches tall, short for our time but about average for his. He is good with his hands and good with his men,

"possessing an iron will as well as an iron frame," according to his doctor. In a moment, Phineas will have a horrible accident.

It will kill him, but it will take another eleven years, six months, and nineteen days to do so. In the short run, Phineas will make a full recovery, or so it will seem to those who didn't know him before. Old friends and family know the truth. Phineas will never be his old self again. His character will change. The ways in which he deals with others, conducts himself, and makes plans will all change. Long after the accident, his doctor will sum up his case for a medical journal. "Gage," his doctor will write, "was no longer Gage." Phineas Gage's accident will make him world famous, but fame will do him little good. Yet for many others—psychologists, medical researchers, doctors, and especially those who suffer brain injuries—Phineas Gage will become someone worth knowing.

That's why we know so much about Phineas. It's been 150 years since his accident, yet we are still learning more about him. There's also a lot about Phineas we don't know and probably never will. The biggest question is the simplest one and the hardest to answer: Was Phineas lucky or unlucky? Once the reader hears his story, they can decide for themselves. But right now, Phineas is working on the railroad and his time has nearly come.

Building a railroad in 1848 is muscle work. There are no bull dozers or power shovels to open a way through Vermont's Green Mountains for the Rutland & Burlington Railroad. Phineas' men work with picks, shovels, and rock drills. Phineas' special skill is blasting. With well-placed charges of black gunpowder, he shatters rock. To set those charges, he carries the special tool of the blasting trade, his "tamping iron."

Some people confuse a tamping iron with a crowbar, but they are different tools for different jobs. A crowbar is for lifting up or prying apart something heavy, whereas a tamping iron is for the delicate job of setting explosives. Phineas' tamping iron was not an average tamping iron either. Phineas had his tamping iron made to order by a neighborhood blacksmith, resulting in a tapered iron rod three feet, seven inches long and weighing thirteen and a half pounds. It looks like an iron spear. At the base, it's fat and round, an inch and three quarters in diameter. The fat end is for tamping—packing down—loose powder. The other end comes to a sharp, narrow point and is for poking holes through the gunpowder to set the fuse. Phineas' tamping iron was very smooth to the touch, smooth from the blacksmith's forge as well as from constant use.

His task is to blast the solid rock into pieces small enough for his crew to dig loose with hand tools and haul away in ox carts. The first step is to drill a hole in the bedrock at exactly the right angle and depth, or the explosion will be wasted. All day, Phineas must keep an eye on his diggers to make sure they keep up. All the time between, Phineas and his assistant are working with touchy explosives.

They follow a strict routine. His assistant "charges" each new hole by filling the bottom with coarse-grained gunpowder. Phineas uses the narrow end of his iron to carefully press the rope like fuse down into the powder. The assistant then fills up the rest of the hole

with loose sand to act as a plug. Phineas will tamp the sand tight to bottle up the explosion, channeling the blast downward into the rock to shatter it.

While his assistant pours the sand, Phineas flips his tamping iron around from the pointy end to the round end for tamping. Black powder is ticklish stuff. When it's damp, nothing will set it off. When it's too dry or mixed in the wrong formula, almost anything can set it off, without warning. But Phineas and his assistant have done this a thousand times—pour the powder, set the fuse, pour the sand, tamp the sand plug, shout a warning, light the fuse, and run like mad.

But something goes wrong this time. The sand is never poured down the hole; the black powder and fuse sit exposed at the bottom. Does his assistant forget, or does Phineas forget to look? Witnesses disagree. A few yards behind Phineas, a group of his men are using a hand-cranked derrick crane to hoist a large piece of rock. Some of the men remember seeing Phineas standing over the blast hole, leaning lightly on the tamping iron. Others say Phineas was sitting on a rock ledge above the hole, holding the iron loosely between his knees.

There is no argument about what happens next. Something or someone distracts Phineas. Does he hear his name called? Does he spot someone goofing off? The reason didn't really matter though because Phineas turned his head. The fat end of his tamping iron slips down into the hole and strikes the granite. A spark flies onto the exposed blasting powder.

Blam! The drill hole acts as a gun barrel. Instead of a bullet, it fires Phineas' rod straight upward. The iron shrieks through the air and comes down with a loud clang about thirty feet away.

The pointed end of the rod enters under his left cheekbone, passes behind his left eye, through the front of his brain, and out the middle of his forehead just above the hairline. It takes a fraction of a fraction of a second for the iron rod to pass from cheekbone to forehead, through and through.

Amazingly, Phineas is still alive. The iron throws him flat on his back, but as his men come running through the gunpowder smoke, he sits up. A minute later, he speaks. Blood is pouring down his face from his forehead, but Phineas is talking about the explosion. His men insist on carrying him to an ox cart for the short ride into town. They gently lift him into the back of the cart so he can sit up with his legs out before him on the floor. An Irish workman grabs a horse and races ahead for the doctor while the ox cart ambulance rumbles slowly down the half-mile to Cavendish. Phineas' excited men crowd alongside, walking next to their injured boss. Still acting as a foreman, Phineas calls out for his time book and makes an entry as he rolls toward town.

Something terrible has happened, yet Phineas gets down from the cart without help. He climbs the steps of the Cavendish hotel, where he has been living, and takes a seat on the porch beside his landlord, Joseph Adams. A few minutes earlier, Adams had seen the

Irishman ride past shouting for Dr. Harlow, the town physician. Dr. Harlow was not to be found, so the rider was sent on to the next village to fetch Dr. Williams. Now Phineas takes a neighborly seat on the porch and tells his landlord what happened to him.

That's how Dr. Edward Williams finds Phineas nearly thirty minutes after the accident. Dr. Williams pulls up in his buggy at the hotel porch, and there is Phineas, talking away. Friends, workmates, and the curious, crowd around as Dr. Williams climbs down from his carriage.

"Well, here's work enough for you, Doctor," Phineas says to him quite cheerfully. Dr. Williams examines Phineas' head. He can't believe that this man is still alive. His skull is cracked open, as if something has popped out from the inside. Accident victims are often too shaken to know what happened, so Dr. Williams turns to Phineas' workmen for the story, but Phineas insists on speaking for himself. He tells Dr. Williams that the iron went right through his head.

Dr. Williams does not believe him. "I thought he was deceived," Dr. Williams wrote in his notes. "I asked him where the bar entered, and he pointed to the wound on his cheek, which I had not before discovered. This was a slit running from the angle of the jaw forward about one and a half inch. It was very much stretched laterally, and was discolored by powder and iron rust, at least appeared so. Mr. Gage persisted in saying that the bar went through his head. An Irishman standing by said, 'Sure it was so, sir, for the bar is lying in the road below, all blood and brains.'"

An hour after the accident, the town's regular physician, Dr. John Martyn Harlow, finally arrives at the hotel. The two doctors confer, but Dr. Harlow takes over the case. Phineas is a gruesome sight. Bleeding freely from his forehead and inside his mouth, Phineas looks to Dr. Harlow like a wounded man just carried in from a battlefield. Yet Phineas is alert, uncomplaining, and still telling anyone who'll listen about the accident.

Dr. Harlow wants Phineas to come in off the porch so he can treat his wound. Phineas gets up and, leaning only lightly on Dr. Harlow's arm, climbs up a long flight of stairs to his room. He lies down on his own bed so Dr. Harlow can shave his head and examine the wound more closely. What the doctor sees is terrible. Something has erupted through the top of Phineas' head, shattering the skull in its path and opening the brain to plain sight.

Dr. Harlow does what he can. He cleans the skin around the hole, extracts the small fragments of bone, and gently presses the larger pieces of skull back in place. He looks inside Phineas' mouth and sees the hole where the iron passed upward through the roof of his mouth. Dr. Harlow decides to leave the hole open so the wound can drain. Then Dr. Harlow "dresses" the wound, pulling the loose skin back into position and taping it in place with adhesive strips. He puts a compress bandage directly over the wound and pulls Phineas' nightcap down tightly over it.

Finally, he winds a roller bandage around his forehead to hold all the bandages securely. Only then does he notice Phineas' hands and forearms, which are black with powder burns. Dr. Harlow dresses the burnt skin and has Phineas put to bed with his head elevated. He gives strict orders that his patient is to remain in that position.

Phineas should have been dead long before this. A thirteen-pound iron rod through the head should kill a person instantly. Surviving that, he should have died of shock soon after reaching Cavendish. He's lost a lot of blood, yet he remains awake and talkative. Even surviving the loss of blood, Phineas should have died of brain swelling. Any hard blow to the body causes injured tissue to swell. The brain is soft, and the skull is hard. A hard blow to the head can rattle the brain around inside like a BB in a tin can. The ratline bruises the brain, and bruised tissue swells. The brain swells, but the skull stays the same size; a swollen brain can jam itself so tightly it will cut off its own blood supply. This swelling can choke off oxygen to parts of the brain long enough to cause permanent damage. It can also cause death.

Here Phineas has a stroke of luck. His is an "open brain" injury. The hole on top of his head gives his battered brain swelling room. The bad news is that his brain is open to infection. At first, though, he does remarkably well. The bleeding from his forehead slows and then stops within twenty-four hours. He remains cheerful and tells Dr. Harlow that he "does not care to see his friends as he shall be at work in a few days."

The morning after the accident, however, he is glad to see his mother and uncle when they arrive from New Hampshire. Two days after the accident, he takes a turn for the worse. He develops a fever and begins to have delirious spells. His wound is leaking a foul-smelling liquid, a sure sign of infection. His death seems just a matter of time now.

More than any other organ, the brain is sealed off from the outside world and from the rest of the body. There are many layers of tissue, bone, and skin to keep it protected from the outside, but there's also a "blood-brain barrier" that keeps out many substances circulating in the blood. Oxygen and nutrients can cross the blood-brain barrier, but many dangerous substances like bacteria cannot. With his skull fractured, Phineas' exposed brain is wide open, making an ideal candidate for a fatal infection.

No one in Cavendish in 1848, no scientist in America or Europe, has the slightest notion that bacteria cause infection. Medical science at this time knows very little about bacteria, even though they were first seen through microscopes nearly two hundred years before.

But few doctors have ever used a microscope, because it is not considered a medical instrument. These microscopic animals might be marvels of nature but no doctor suspects that they have anything to do with disease, let alone infections. Doctors at this time don't use the word "infection," but they know its symptoms well. They call it "sepsis," and they know from bitter experience how quickly a "septic" wound can go from slight redness to gross swell to a fatal condition called gangrene.

But the doctors of the time don't realize that gangrene is the end result of bacterial infection. They don't realize that floating in the air on dust particles, lurking on fingertips, or growing on the shiny steel blades of their unwashed surgical scalpels are single-celled bacteria and other microscopic life forms. On the smallest surface, there are hundreds of millions of them. They represent thousands of different species; there are tiny plants, tiny fungi, tiny viruses, and tiny animals. Among the microanimals are two particularly dangerous families of bacteria—streptococci and staphylococci ("strep" and "staph," for short). What doctors don't know in 1848, strep and staph do: that the broken head of Phinease is an ideal location to land.

A wound is an open door. A cut or break in the skin lets staph and strep bacteria colonize the warm, wet, nutrient-rich cells inside. Once these bacteria get established in the body, they reproduce wildly. The body's immune system tries to kill the invading bacteria with an array of special immune cells, while the bacteria try to protect themselves against immune cells by cranking out toxic chemicals. That's an infection. The site of this biological battle between the immune system and bacteria swells up and turns red.

It will take nearly a century for science to develop the first "antibiotic," penicillin, to counter infections. In 1848, a young Frenchman named Louis Pasteur is studying chemistry in Paris. Eventually, Pasteur will unravel the three great biological mysteries of his time—fermentation, decay, and infection. All three processes are the work of living microorganisms; Pasteur will call them "germs." Pasteur's "germ theory" will lead to a revolution in medicine. It will inspire an English surgeon named Joseph Lister to try performing surgery in sterile conditions that exclude or kill all microorganisms. Lister will scrub his hands almost raw before operating, he will boil surgical clothing and instruments, and he will set up a machine to spray carbolic acid in the operating room to kill germs in midair. Lister's first sterile operations in 1868 will cut the number of deaths from infection after surgery by 90 percent. For the first time in history, doctors will help more patients with surgery than they harm with postsurgical infections.

None of this progress to come will do Phineas a bit of good. Instead, Phineas is saved by luck and good care. Dr. Harlow follows the best medical advice of his time—keep the wound clean but covered and watch for inflammation. Fourteen days after the accident, Phineas develops a huge abscess under the skin just above his eyes. Phineas is feverish, losing his appetite, and sinking fast. Dr. Harlow lances the abscess, drains the pus and dresses Phineas' forehead again. The fever abates. His scalp begins to heal. Phineas is saved by his youth, his iron constitution, and Dr. Harlow's good nursing.

And then, the patient gains strength. Too much strength, in his doctor's opinion. Dr. Harlow is called out of town for a few days, and when he comes back he finds Phineas out of his sickbed. His head still heavily bandaged, Phineas is roaming about Cavendish in the rain with no coat and thin shoes. He is eating unwisely, refusing nursing advice, and ignoring doctor's orders.

Phineas says he wants to go home to his mother's house in Lebanon, New Hampshire, twenty miles away. He intends to walk. According to the best medical theories of his day,

Dr. Harlow diagnoses an imbalance of bodily "humors." This theory, dating back to the ancient Greeks, declares that health is maintained by a balance of four liquids, or humors, in the body—blood, phlegm, yellow bile, and black bile. To bring them into balance, Dr. Harlow prescribes two powerful drugs—an "emetic" to make Phineas throw up and a "purgative," a powerful laxative, to evacuate his bowels. Phineas is knocked flat by the medicines and spends the next two weeks in bed, where Dr. Harlow keeps him on a "low," or bland, diet. His humors may or may not be in balance, but Phineas is resting quietly at last.

Ten weeks after the accident, Dr. Harlow declares Phineas fully recovered from his wounds. He puts Phineas in a closed carriage and sends him home to his mother in New Hampshire. Phineas is very weak, but he can walk short distances. He can count, feed and dress himself, and sing. He can speak clearly and make sense of what he hears. Yet there is something odd about the "recovered" Phineas.

Just before he leaves Cavendish, Dr. Harlow gives Phineas a little test. The doctor offers Phineas $1,000 for the pocketful of pebbles that Phineas has collected walking along the Black River near town. Dr. Harlow knows that Phineas can add and subtract, yet Phineas angrily refuses the deal. Dr. Harlow tells himself that a man who was so badly hurt is going to need time to regain his full powers.

As soon as Phineas leaves for home, Dr. Harlow writes a short report for a leading medical journal. Most doctors ignore the article. The few who read it don't believe it. How could a man survive such an injury, let alone make a "complete recovery"? But one Boston doctor, Henry J. Bigelow, is intrigued. He writes to Harlow for information and urges him to back up his case by collecting formal statements from eyewitnesses.

In the spring, Phineas goes back to Cavendish, carrying his tamping iron. He never goes anywhere without it these days. Phineas has come for a final examination by Dr. Harlow and to reclaim his old job on the railroad. His left eye looks intact, but the vision has gradually faded away. Phineas has a huge scar on his forehead and a small scar under his cheekbone, but otherwise he is physically healed. Yet Dr. Harlow has private doubts about Phineas' mental state. Phineas is just not his old self.

His old employers on the railroad quickly come to the same conclusion. The new Phineas is unreliable and, at times, downright nasty. He insults old workmates and friends. He spouts vulgar language in the presence of women. He changes his mind and his orders from minute to minute. The railroad contractors let him go. Dr. Harlow, who is keeping confidential notes on Phineas, sadly writes, "His contractors, who regarded him as the most efficient and capable foreman in their employ previous to his injury, considered the change in his mind so marked that they could not give him his place again.

Phineas' old friends also wash their hands of him. Dr. Harlow writes: "He is fitful, irreverent, indulging at times in the grossest profanity (which was not previously his custom), manifesting but little deference for his fellows, impatient of restraint or advice

when it conflicts with his desires." Phineas comes up with all sorts of new plans, the doctor writes, but they are no sooner announced than he drops them.

Phineas is like a small child who says he is running away from home after lunch and then comes up with a new idea over his sandwich. Dr. Harlow writes, "A child in his intellectual capacities and manifestations, he has the animal passions of a strong man." A doctor is bound by his oath not to reveal the details of a patient's condition without permission, so Dr. Harlow will keep his observations to himself for twenty years.

Meantime, Dr. Harlow receives another letter from Dr. Bigelow at Harvard, who thanks him for collecting the eyewitness statements about the accident, and asks: Would Mr. Gage consider coming to Boston at Dr. Bigelow's expense so his case could be presented at the medical school and before the Boston Society of Medical Improvement?

In the winter of 1850, Phineas goes to Boston so the doctors there can see for themselves, tamping iron in hand. A prize specimen, Phineas is examined, measured, and discussed. He agrees to sit for a plaster "life" mask. Dr. Bigelow puts straws up Phineas' nose so he can breathe while the doctor pours liquid plaster over his face. From it, Dr. Bigelow casts a three-dimensional version of Phineas' face. The enormous scar on his forehead is clear. The casting clearly shows scars where the iron went in and came out. Yet there are doctors who think that Phineas is a humbug, a fake from the back woods of Vermont.

The plaster head remains in Boston, but Phineas and his tamping iron soon slip out of town. He travels from city to city through New England and ends up at P.T. Barnum's American Museum on Broadway in New York City, the story goes. In Barnum's time, people pay to see "living giants," "bearded ladies," and calves born with two heads. People have always gawked at strange and unusual things.

Barnum's special genius is "improving" the unusual. Hype and humbug make Barnum's museum a roaring success. He pulls in the crowds with half-fakes like the "Woolly Horse," a strange, long-haired horse that Barnum declares is a newly discovered species, being part deer, buffalo, elephant, camel, and sheep. At least the Woolly Horse is a real horse. Barnum's "mermaid" is a total fake, a counterfeit fossil pasted together from bones withered skins, and who knows what else. Barnum shows his "mermaid" alongside real exotic animals like orangutans and grizzly bears.

Barnum floods the exterior with the brightest lights in all of New York. Inside, the lighting is deliberately dim. The noise is deafening, with actors, jugglers, and the glass blowers working the crowd.

Barnum's museum billed Phineas as "The Only Living Man With a Hole in His Head." The poster and one-sheets depicted a husky young man smiling broadly in spite of a huge iron bar which stuck out of his head. Of course, the iron bar no longer protruded from Gage's head but he had it with him, and another skull, also perforated. During his sideshow performances, he would shove the long iron through the holes in his extra skull to demonstrate just how he was injured. All the details were to be found in a pamphlet he

sold, and by paying ten cents extra, skeptics could part Gage's hair and see his brain, what there was left of it, pulsating beneath the new, thin covering.